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THE TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY.

VOL. X.

SESSION 1884-85.

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1885.

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PREFACE.

THIS, the tenth volume of the Society's Transactions, contains a record of its proceedings during the Session 1884–85.

In it, as in former volumes, the views brought forward in the papers are to be considered as those of the writers themselves, and not as endorsed by the Society as a body.

November 1885.

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TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY,

FOR SESSION XLVI., 1884–85.

Meeting I.—November 12, 1884.

Dr J. Connel, *President, in the Chair.*

I. *Professor Simpson* showed an ovarian tumour with twisted pedicle, recently removed.

II. *Dr Brewis*, for Dr Angus Macdonald, showed (1) a carcinomatous uterus removed successfully by the vaginal method of extirpation; (2) ovary and tubes from a case of Tait's operation.

III. *Dr Skene Keith* showed a fibroid tumour removed from a patient in whom the tumour was causing distressing angina by pressure.

IV. *Dr Bruce* showed a six months' fœtus, with many parts undeveloped, and with a large cystic formation on its back. One eye was only partially developed, and could be scarcely seen.

V. *The President* gave the following

INTRODUCTORY ADDRESS.

Let me congratulate you, gentlemen, on the auspicious occasion of our reassembling, after a summer and autumn which have been prolific of natural blessings to our country, as well, I trust, as of bodily and mental renovation to ourselves.

The least observant must have felt this year the special glory of the autumn woods; and who that regarded them was not touched with the thought of that Divine generosity which makes such

glories free to all? Not for seventeen years has there been such a perfect cycle of tree life as we have this season witnessed; and the sight of it has given, I think, to Homer's words, a hopefulness which they could not have upon a Trojan battlefield,—"Οια φυλλων γενεη, τοίη δε και ἀνδρων,"—As is the race of leaves, so is the race of men.

It is true that the time suggests decay rather than generation or parturition; but at the threshold of another period, even of obstetric work, it is well to remind ourselves of that reciprocal action which seems to take place between external nature and the human mind, rendering the autumn and winter of the one the seed time and high summer of the other.

I cannot but think that a season more than usually bountiful will be followed by a quickened and strengthened intellectual productiveness on the part of our own and other scientific societies. In the mental, as in the spiritual world, there are times of greater refreshing and revival; and it may be expected that the workman, more than usually invigorated, will put forth his renewed energy in still greater efforts. No society can show a record of better or more thorough work than our own, and the hope may fairly be permitted that during this session it will not fall below its former level. Several older members have now quite withdrawn themselves from our discussions, but we have every reason to be satisfied with the infusion of young and active blood which has year by year been added to our vital current. Let the young members bear in mind that our eyes are upon them, and long may it be before the cares of the world, and the deceitfulness of riches, and the lusts of other things, choke the good word which they have begun to utter. The last two, indeed, in this category of obstructions need scarcely be dreaded, though neither would I hazard a too dogmatic assertion on the subject; but the first, viz., the cares of the world, is one with which every working man in our profession is probably too well acquainted. While our first duty is, undoubtedly, to the patients who have put their life and comfort in our hands,—and with the majority this duty will be (and rightly) all-absorbing,—yet it behoves every well-equipped student to beware of neglecting the gift that may be in him of power and faculty to hold up and hand on the lamp of scientific progress and acquirement. Happy is he whom the necessity of subsistence does not drive at once into the "bread-and-butter" way of viewing all professional questions; and, having escaped this danger, he may congratulate himself again if some judicious friend of larger experience take him kindly by the hand and assist him to the knowledge of himself. Let any one among us who with ingenuous mind began alone his battle with the world, think of the wasted energy, the opportunities that were with him when he knew it not, the damaging and even fatal errors he committed,—in short, the now impossible might-have-been; and does he not yearn to stretch out the guiding hand to his

younger brother? Great as may have been its abuses, there was much to be said for the old apprentice system; but now that it is gone, irrevocably for most, its place is best supplied by the mutual and voluntary help which may be found in associations like this. Let us, therefore, not leave the missionary spirit in sole possession of our secretaries, but go out ourselves and bid all young brethren to our table.

The wisdom of encouraging original inquiry among mere students might possibly be doubted, though there is always a percentage of stronger minds in whom the earlier development of the reproductive faculties does not retard the processes of digestion and assimilation so necessary to individual growth. Moreover, the region of the Known, even in our own department, is so vast, that of most of us it may be said that we are ever learning yet never coming to the knowledge of the truth. While the student's chief duty is to acquire, an equal responsibility lies on every man judiciously to spend and scatter the knowledge which experience brings him; and a task that would well repay the trouble would be for every one to consider what are the personal helps and hindrances to such intellectual development as he may be capable of. Can it be that most men in our profession are too modest? The question may provoke a smile, but I am not sure that it could be answered by a general negative. Be that as it may, however, I do not think it is out of place on our opening night to consider how we may best bring out the latent faculty that may be among us. I take for granted that we shall at all times do our best to gather together the raw material of a society, for without the *esprit du corps* everything else will languish. But the members being here, the question is how best to generate intellectual warmth and consequent growth? I wonder how the apostolic precept would serve us,—"Let *every* man be swift to hear, slow to speak, slow to wrath?" I take it that herein we shall find the whole duty of an obstetric, or any other, fellow. Underlying all three injunctions is the idea of active, moral, and intellectual *force*. Every man simply ought (like Mrs Dombey) "to make an effort,"—an effort to be a willing *learner*, a judicious *teacher*, and a kind and helpful *friend*. We shall always, I trust, pay a frank deference to those who are entitled to speak with authority; but while criticism must be perfectly free and unbiassed, I would bespeak an encouraging sympathy for the attempts of literary primipari, so long as their offspring is legitimate. Most willingly would I here puncture the perhaps "preternaturally tough membranes" of some middle-aged parturient. I would even thankfully recognise the good nature of any member who brings on occasion a piece of what might be called "padding," rather than allow the evening to pass unemployed; and I am sure we are deeply indebted to our secretaries for their continuous watchfulness in this respect. To be assured of a patient hearing and a pains-taking criticism is enough encouragement for any man who brings

forward a subject for discussion. I only express the common feeling when I promise any new comer a cordial appreciation of his work. Let him disabuse his mind of the impression that communications are of value in proportion to their length. If a general rule were to be made, I would say it ought to be the reverse of this. I well remember Goodsir's warning to intending theses writers,—"Gentlemen, a thesis should not be long, but short." Attention to this would be the best illustration of "slow to speak," as it would be the best guarantee of "swift to hear." Better that we should sit and wait for the Divine afflatus than spend one hour in unprofitable talk; but better, too, that we should meet in silence than that we should not meet at all.

It is not boys alone who have to be reminded that the man should ever be greater than his work, and that the most certain way of making and keeping himself so is to be always reducing the particular to the general; or, in other words, bringing his local and personal experience to the test of universal principles, and merging his private interests in the common good. Happy are they who by connexion with such a Society as this have it in their power to practise this humane and manly virtue, for if one has nothing original in himself the originality which he appreciates in another becomes truly his own.

One limit we, of course, impose by our constitution. Varying Plato's prohibition to suit our purpose, we say,—"Let no one enter here who does not know obstetrics." But we want more than knowledge; we want enthusiasm. The medical study of women and children offers I know not what bright prospects of future benefit to our race. It is, I think, our great Edinburgh physiologist, Combe, who somewhere remarks that, other things being equal, the most distinguished and useful men have sprung from mothers who during pregnancy have been supported in their daily duties by a steady faith in their husbands,—a certain continuous and undisturbed exaltation, as it were, of the natural wifely affection. I believe that in this our most Christian civilization we fall far below the old Greeks in our special care of the pregnant woman. The poet Byron has been often pointed to as a conspicuous illustration of pre-natal maternal influences; but we would find the same thing, if we looked close enough, in every mischievous brat upon the street. I cannot, unfortunately, do myself the honour of listening to the Morison lectures now in course of delivery by one of our oldest and most respected Fellows; but it is no disparagement to him to say that the nervous diseases of women will still be a fruitful subject to obstetricians of a later generation. "Rerum cognoscere causas" has been held in all ages the goal of philosophic inquiry; and what investigation is fraught with brighter promise to mankind than that which concerns itself with the generation and maturation of the human embryo?

Not in dark things only, but in all things, the highest uses are

the moral; and we seem to see in our special work opening vistas of knowledge and advancement, which we have as yet scarcely entered upon, in all that refers to the mutual relations of the sexes and their respective influences on their progeny. Let us but cherish in regard to our work that constant exaltation of feeling which I have just spoken of, and not only will our Society enjoy the distinction which was assigned by the presbytery to Dr Chalmers in his youth, viz., "that he was a lad o' pregnant pairts," but our lusty offspring, having no reason to be ashamed, will yet speak with their enemies in the gate.

I saw that in his opening address Principal Sir Alex. Grant quoted from a German writer a sentence which should be well kept in mind, and which busy men are in as much danger of forgetting as their younger student brethren: "The great necessity," he says, "of the present day is an organic fusion of idealism with the results of modern science." If, on the one hand, the poet and the theologian have been too ready to exclaim, "Why labour at the dull mechanic oar when the fresh breeze is blowing?" forgetting that by labour only can we make physical advance, is it not true, on the other hand, that the votaries of the scalpel and the microscope have narrowed their view to merely physical aspects, and become soul-wearied in the endless minutiæ and details of structure? I do not see how we can ultimately fail of despising our work if we do not keep our eyes upon the moral end of it.

To lighten, and even remove, the primal curse of labour, by ascertaining and applying the true method of nature, *i.e.*, the fixed conditions of good health and conduct, this certainly is our work; but it is a cheerless task if through it all we do not carry with us the heart-quickening principle that "all thinking things, all objects of all thought," are of moment to us only in so far as they tend and lead to that which is beyond themselves.

Gentlemen, I confess that I am neither young enough, nor learned enough, nor (if you like) wise enough to be a pessimist. The faith by which I live is that the over-ruling Power means well—nay, the very best—to every one of us; and, among other things, that the human race shall outlive, I do not say natural decay, but pathological conditions. Even from pre-historic time parturition has been to the human female a season of trial and danger. Explain the Mosaic writings as we may, a legend had existed which assigned to woman a peculiar curse and burden in the process. Viewed physiologically, it is, of course, simply an example of morbid evolution, *i.e.*, a want of harmonious development between the fœtus and the maternal organs. Does the question not frequently arise to us, "Must it ever continue to be so? and may not wide possibilities be hereafter open to us in the way of amelioration?" I know not what better object an obstetrical society can set before the inquiring mind than such an investigation. As yet we can but do a very little in relieving the mother and assisting the infant; but

why should we despair of by-and-by, through a sound knowledge of tissue development, teaching nature herself to make the process safe and easy?

I believe—because the highest reason encourages the belief—that vertebrate man, the offspring of child-bearing woman, shall yet "in his flesh see God." Far off as yet is that Divine event, and long ages may roll bye ere man is capable of the vision. For aught I know, it may be some negro race, with their higher spiritual capabilities, who, in fuller light and happier surroundings, will "glorify Him in their bodies, which are His;" but that some such consummation exists even now in the Divine thought I do not for one moment doubt. And even were my destiny to be, like the last red leaf of autumn, whirled for ever away, I would still exclaim, "In this faith and hope let me perish!" But materialism itself has an antidote against despair. Let me quote a sentence from one of its most temperate critics. "The philosophy," says George Brimley, "founded on materialism professes the power to elevate human life to heights of felicity and knowledge of which we as yet only dream; that it will bring round the golden year for which poets have tuned their most stirring songs, and prophets yearned upon their watch-towers; and could it perform all that its votaries promise, what would be the inevitable result? Undoubtedly that the lovelier and the richer life grew—the higher in dignity, the firmer in purpose, the fuller of grand results—the fiercer would rise the longing for immortality; the more should we shrink back, appalled with horror, from the thought of personal annihilation." What is this but to say, in other words, that the conditions of all right living "presage immortality,"—that the truly "good, great man" has eternity within him? How much more, then, when he feels that he is a fellow-worker with the Central Force, and knows his purest happiness, here or hereafter, to be that he consciously contributed to the glorious issue?

If these considerations do not stimulate us to diligence, then I confess I have no stimulus to offer. In the history of that great medical school and university to which we hold ourselves closely affiliated, the passing year will be an ever-memorable one. For nothing, perhaps, was our great festival more remarkable than for the fine and reverent spirit which distinguished it. One seemed to feel the smiling approval of the beneficent Over-Soul. What an influence to radiate "for the healing of the nations!"

I speak for the great body of my country brethren when I say that we have not the opportunity, nor perhaps the ability, for original investigation; but, leaving this to our more favoured colleagues, we may be well content if by the steady and humane application, in our own humble sphere, of that scientific truth which is being yearly conquered for human use, we can persuade our less enlightened neighbours how gracious is the Spirit which "o'er the earth presides, and o'er the spirit of man." Let us never despise,

however, the smallest contribution to the common stock. How long and how broad often is the basis, both in time and in space, that underlies a simple but great result. It may have happened to some of you, as it lately did to myself, to come unexpectedly, in the course of a sea-side ramble, on one of those submarine cables which connect our British Isles with the eastern or western Continent. The heart seemed to suffer a sudden inhibition from its infinite suggestiveness. It was not alone the thought of the buried treasures by which it might be threading its silent way, more voiceless than the waves of any tidings of them. Nor was it that your exiled friend or brother could now tell you of his safe arrival at Vancouver's Island or the Antipodes, ere yet that other force which had served the good ship so well on her long and perilous voyage had ceased to rush tumultuously from its prison house. Nor yet was it the bead-roll of gifted minds—Galvani, Oersted, Thomson, Faraday, Ampère—that your imagination chiefly dwelt upon. Their fame is safe. But you thought, as in fancy you followed it beyond the far horizon, of the nameless and forgotten multitude of toiling hands that had helped to span with it the illimitable waters. No eye but God's could have marked at one and the same moment those two ships which, five-and-twenty years ago, went climbing, from opposite points, the great ocean arc that divides the old world from the new. Day and night, hour after hour, fathom by fathom, they kept paying out their line into the sea. But a day came when in mid-Atlantic they saw and recognised each other's signals. In one hour the ends were spliced, and then out beyond the shingle and the sea-weed the message went flashing through a thousand leagues!

I would not so indulge imagination did I not know how much of that genius, which is best defined as "the power of taking pains," can be assembled round this table. But for the workers' own sakes I would have the work perfused with some of this idealism. We know little or nothing as yet of the development from pre-natal influences of that morbid crystallization which we call pathology. In the mysterious recesses of the nervous system, physiological and psychological, these processes have still to be traced; but that we shall yet know as we are known, *i.e.*, as He who made us knows us—if not in degree, at least in kind—is a conviction which all rational experience, including revelation, warrants us in holding. It is not yet a quarter of a century since the localization of function in the brain was only a "pious opinion." It may be fifty or a hundred years more before another generalization of the same kind is possible; but we may depend upon it that many a fact which now appears to us trivial enough is but the shore-end of an unspliced cable that is to bind the universe together.

What an incentive to every trained and cultivated mind to be consciously moved by that highest ambition which, name it as we

may—whether "the best use of our faculties," or "sympathy with the Over-Soul," or "the earnest expectation of the creature," "the groaning and travailing of creation," or simply "evolution" and "development"—was evidently the final purpose of our existence, and in the carrying out of which we have the inward proof that "earthly power doth then show likest God's!"

It would puzzle me, gentlemen, to know from what text I have preached; but it seems to me quite fitting to begin our session in the spirit I have endeavoured to indicate. I am no believer in good or evil fortune. The building is not completed till every separate stone has been laid with unremitting toil; but the work will go none the less merrily for the thought of the pleasant days that may yet be spent in it.

May the session be a prosperous one, and may every one of us help mutually and well!

A vote of thanks, proposed by Dr Craig and seconded by Professor Simpson, was unanimously accorded.

VI. A SYNOPSIS OF SOME CASES OF CRANIOTOMY TREATED IN THE SIR JAMSETJEE JEJEEBHOY OBSTETRIC INSTITUTION, BOMBAY.

By Surgeon-Major ARNOTT, M.D., Bombay Medical Department.

MR PRESIDENT AND GENTLEMEN,—I beg leave to place before you an abridged record of some cases treated in the hospital under my care in Bombay, in the hope that they may be found interesting, as illustrating the sort of work that falls to the lot of an obstetrician in India.

I present to you the cases of craniotomy treated from January 1st, 1883, till my departure from India on furlough in July 1883, because during that time I was able, with an approach to regularity, to carry out antiseptic treatment in all operations, and indeed in all cases, and with encouraging success. The results in 1882 were by no means so satisfactory, and it remains to be proved by the results obtained on my return to India whether the improvement is due to careful antisepticism, or was merely accidental. You who are accustomed to a thoroughly well-drilled and intelligent hospital staff can hardly realize how difficult it is to introduce antisepticism and carry it out methodically in an Indian hospital, in which the nurses are women of no experience, and the native servants stupid and apathetic, and without the faintest glimmer of knowledge of the reasons for so much attention to detail. One may draw up the most careful standing orders, but they are useless unless carried out conscientiously by nurses, students, and ward servants, and the thoughtlessness of one person may render

fruitless the greatest care of several. For instance, I remember on one occasion when about to leave the operating room, after having taken the greatest pains with a case, being horrified to see the sweeper woman, whose duty it is to look after the W.C., urinal, bed pans, etc., and generally to do all the dirty work of the hospital, and who is also often more or less of a midwife, meddle with the case, and in one second neutralize all the previous antisepticism. But gradually all concerned with the treatment of cases were becoming habituated to the routine and details of antiseptic precautions, which I may say are thoroughly carried out in the surgical hospitals in Bombay.

The hospital building has many defects, which I brought to the notice of Government, and doubtless, when circumstances permit, an hospital fulfilling all modern requirements, and in which work of the best kind will be possible, is sure to be erected. At present work is carried on uncomfortably and under unfavourable conditions. But in every building in Bombay we have this advantage, that the doors and windows can nearly always be left open, and thus we have more favourable conditions than the appearance and architecture of some of our hospitals would encourage us to hope for.

So far as my own experience goes, osteomalacia is, relatively to rickets and also absolutely, more common in India than in Europe. Nearly every year we treat in hospital at least one case of deformity so bad as to require removal of the child by abdominal section, and we have 15 or 20 cases in which craniotomy is required, —a number of severe cases which is, I think, greater than is met with in most lying-in hospitals at home. The number of operations in hospital is annually increasing, which fact, however, means that year by year confidence in European medical skill is spreading, and not that disease is increasing. And here I may be allowed to remark, incidentally, that among other blessings due to British rule in India we may expect that as native quackery is replaced by scientific medicine and surgery, and confidence in the latter is taught by native practitioners, many of whom are men of distinguished attainments, and by educated midwives, the present excessive mortality of native women in the child-bearing period will be diminished.

Of these cases of extreme deformity, some are due to rickets, but a large proportion are the result of osteomalacia, and of these latter a considerable number are Mohammedans. I do not know why there should be so great prevalence of distortion of the pelvis in India, or why in Bombay the Mohammedans should give us more cases than any other caste. But you are aware how different the climate and diet of the people is to what prevails in this country, and you have heard, probably, how different the social life is of the people, regulated as it is so much by caste

customs or ordinances. For instance, I may mention the custom of early marriage, and the seclusion in which high caste women, both Mohammedans and Hindus, are kept. As regards the women of the bulk of the population of Bombay, and speaking generally, there is this broad distinction between the Hindus and Hindu outcasts and the Mohammedans, that the former are more employed outside their own homes as labourers, and in various other ways, and thus lead a healthier life. I may also direct attention to the exceeding prevalence of cachexia due to malaria, and low scorbutic condition. A syphilitic taint is also common.

You will observe that in many of the cases there was a very rapid pulse and high temperature. I do not know that these symptoms by themselves are of so serious import in practice in Bombay as they would be at home. The pulse in the native woman seems to be accelerated very readily, and I think that, as I have just mentioned, the almost universal prevalence of more or less of a malarial taint predisposes to feverishness which may pass off in what to a practitioner in Europe would seem a surprising manner. But, on the other hand, vitality is less robust in the Indian woman, and sometimes a fatal result occurs unexpectedly and without evidence of a sufficient cause.

All the cases left hospital before recovery was complete. This is the rule in Indian hospitals. The poor in India have as great an aversion to hospitals as the poor in this country, but in their case it is probably justified by bad conduct of native ward servants, who, though apparently zealous and attentive to duty when the *Sahib* is present, are, I suspect, careless, perhaps even cruel, at other times to those who are unable to propitiate them by gratuities, or unlikely to complain, and especially where the sufferer is of inferior caste. Dislike to be among patients of other castes, and a desire to employ those remedies and follow those customs to which they are used in their own homes, and which are, of course, quite incompatible with hospital discipline, also induce them to leave hospital on the earliest possible day. To these must be added in all serious cases the desire to die at home, and the desire on the part of their relations that at the time of death all caste customs and superstitions should be rigidly carried out.

Most of the cases come to us in an unfavourable condition, having been in labour for one or more days, and subject to the rough manipulations and remedies of uneducated native midwives. These midwives, as a rule, have no knowledge of anatomy or of midwifery as taught in Europe, and when the labour does not progress have recourse to violent attempts to aid labour, or if pains are weak place irritating medicaments in the vagina. Sometimes

they even beat the patient to exorcise some evil spirit. Hence not infrequently they tear off limbs, or in breach cases tear the trunk from the head, or injure the maternal soft parts, which we find generally swollen and inflamed. They seldom send a case to hospital till they believe a fatal result to be near, and the people themselves, especially the Mohammedans and others of good caste, do not care to call in the aid of a man till they fear the result. But matters are improving, a few midwives are trained every year in the Grant Medical College, and books have been translated, with the effect of leavening the whole class of midwives with knowledge, and the people are gradually realizing that European skill may often save life.

In practice in Bombay we may, I think, in cases of minor distortion save the life of the child, and in cases of extreme distortion abstain from abdominal section in cases which in Europe would in the one class forbid us to attempt delivery by forceps or turning, or in the other demand Cæsarean section or Porro's operation, because native children in Bombay are considerably smaller than Europeans, the children of the best castes averaging about a pound less than European children, and the children of some other castes being about a pound lighter. The cranial diameters are smaller in nearly the same proportion. But in hospital practice we lose in minor deformity cases the advantage of this, because cases are brought to us in so unfavourable a condition, the child often dead, and the mother in a state of imminent danger, that delivery has to be accomplished as quickly and easily as possible.

The operations were all performed under chloroform. I perforated the head by Simpson's perforator, an instrument which is so efficient and safe that I question if it will ever be entirely superseded.

For traction, or to break and remove the bones of the vault, I used either the craniotomy forceps, the cranioclast, or the guarded crotchet, or in some cases, *where the space available gave facility of use*, the cephalotribe was used. By any of these the difficulty may be overcome in cases where there is only moderate deformity. But in bad cases, under which I would include all with a diameter *under* 2½ in. at the brim, and with deformity also in the cavity and outlet, the operation is difficult and tedious and dangerous, and is at first puzzling to decide as to which instrument to employ, and how to proceed. As far as my experience goes, it leads me to think that after evacuation of the contents of the cranium, the bones of the vault should be crushed, and, if necessary, removed, and traction made by any of the instruments above alluded to, though I prefer the guarded crotchet or the cephalotribe, which I have found less likely to slip than the craniotomy forceps or cranioclast. If the base will not pass, what is to be done? Is it

necessary or desirable to adopt the elaborate crushing operations of the base which have been described by various writers, and to provide instruments for which much ingenuity has been expended? I would ask some of those present whose experience has been greater and over a longer period than mine, and who therefore can speak with authority, for an opinion on this point. My own experience is not sufficient to justify a strong opinion, but, so far as it goes, it leads me to this, that the difficulty can in all cases be overcome (as has been pointed out by Barnes and others) by tilting the base of the skull on end, as can readily be done by seizing it by the guarded crotchet, one blade of which is fixed in the posterior nares, and the other applied to the base through the wound caused by the perforator, or the base may be in the same way seized by a crushing instrument. I have in this way succeeded in cases where the conjugate measured less than 2 inches, and I venture to think that a greater success can be obtained by thus, as it were, "dodging" the base past obstacles, than by smashing up the base by the cranioclast or cephalotribe. These instruments are not easily and efficiently used where there is great deformity—the head loose above the brim, and the space to work in so small, that the blades can hardly be properly applied even after several attempts, during which there is very great risk of the soft parts being injured. Some of the disadvantages of the cephalotribe I heard Professor Simpson describe to his class in the introductory lecture this year, and I think he brought them before this Society some four years ago; and as regards the cranioclast, I shall not soon forget an operation I saw at one of the great continental schools, in which, though the anterio-posterior diameter was 2 inches or more, and the operator had fractured the base and removed a portion of it and of the bones of the face by the cranioclast, he was unable to extract by that instrument, and the operation was completed by podalic version.

In my humble opinion it is a mistake to attempt comminution of the *base* of the skull until we have attempted and failed to get it past the obstruction end first, and I believe that the latter procedure is the safest as well as the most efficient.

I have never tried the method of cutting through the skull by an écraseur, but I do not understand how the wire or chain could possibly be applied in cases of extreme deformity, and in other cases it is unnecessary. Nor have I ever tried the basilyst of Professor Simpson, which was not known in Bombay up to my departure for home, but I think that *if the base must be comminuted*, the basilyst is more suitable for the purpose than the cranioclast or cephalotribe.

I have often felt the want of an instrument less ponderous and bulky than the cephalotribe, and at the same time sufficient to seize, and, if necessary, compress the base of the skull, and

which would be available for cases of extreme deformity. The basiotribe of Professor Tarnier to some degree supplies this want, but I hope will be improved on. The screw perforator of Tarnier's instrument is, I think, rather too sharp, and not so good as the basilyst of Professor Simpson, and the handles should be large and wooden. I am inclined to think that a combination of the basilyst with powerful fenestrated blades for compression and traction, an instrument which will thus take the best parts of the basiotribe and the basilyst, will in the future be the most useful instrument in our armamentarium *if it is necessary to comminute the base.*

The after-treatment of my cases was simple—antiseptic lotions, either of Condy's fluid or liq. sod. chlor., or carbolic acid; quinine and opium as an antiphlogistic and antipyretic, and often liq. sodæ chlorinæ in half drachm doses as a possible internal antiseptic, and certainly an agreeable drink, which seemed to clean and moisten the mouth and keep the bowels regular. The diet was conjee and milk. Sclerotic acid subcutaneously was often used, but frequently caused painful abscess and feverishness. I shall not use it again.

In some cases there were superficial sloughs of the labia or in vagina, and consequent offensive discharge. This was for the most part the result of the unfavourable condition in which the patients were admitted, the unhealthy condition of the soft parts tending to slough. Once or twice, also, there was slight tear of the vaginal portion of the cervix.

One case (No. 8) proved fatal within twelve hours after operation. She had been admitted in a hopeless condition, but I thought it my duty to operate. Another case (No. 4) was discharged in a somewhat unsatisfactory condition, having renal anasarca, and having had subsequent to operation one or two attacks of malarial fever. The other cases were all discharged in a satisfactory condition. I shall now read to you a summary of some of the cases.

I. *Osteomalacia*—J. A., primipara, æt. 15, Mohammedan. Admitted 7th January 1883 at 4 P.M. Labour pains began three days ago, and continued till 10 A.M. to-day, since when they have all but ceased. She has been for two years suffering from mollities ossium, and was under treatment in the Jamsetjee Jejeebhoy Hospital. Temp. 100°·8, pulse 120. On examination, bladder distended, dirty discharge from vagina. Head impacted in pelvis in first position, ant. post. narrowing to 2¼ inches; os imperfectly dilated, but dilatable. Operation at 5.50 P.M. was somewhat difficult and tedious. The craniotomy forceps and subsequently the cephalotribe used. There was slight post-partum hæmorrhage. Patient very exhausted. Delivery completed at 6.30. The vagina

washed out by antiseptic lotion, and quin. and opii. pills and liq. sodæ chlorinat. prescribed.

9*th.*—Temp. 99°, pulse 128. Lochia offensive; some diarrhœa.

11*th.* — Temp. 100°·8, pulse 112. Lochia offensive; no pain.

13*th.*—Temp. 99°·6, pulse 112. Lochia normal.

15*th.*—Temp. normal, pulse 100.

16*th.*—Discharged. Prognosis favourable.

II. *Rickets.*—D. T., æt. 21 years, Hindu (Mahratta) admitted 6th February 1883. The patient has an angular curvature of the spine in the dorsal region, caused, she alleges, by a fall down a stair when she was 3 years old. The abdomen has that peculiar prominence observed in all cases in which the head is arrested above the brim. Her general condition is good. Labour began three days ago. On examination the spine and tuberosities of the ischium so approximated as to reduce the transverse diameter of outlet to 1½ inches, and the rami of the pubes in close apposition giving the rostrum shape, and the promontory of the sacrum projecting diminishing the conjugate at the brim. Vertex can be felt above the brim, apparently occupying the third position; membranes unruptured, os and cervix rather rigid (its amount of dilation not noted). I waited for some hours for farther dilation of the cervix, which, however, was still incomplete, when at noon I determined to complete delivery by craniotomy. At noon the head was perforated as usual, and seized by the craniotomy forceps, and afterwards by guarded crotchet, and pulled down (after evacuation of its contents). The skull was then seized and crushed by the cephalotribe and extracted. There was a slight wound of left labium caused by a fragment of bone. The vagina was as usual washed out by a solution of Condy's fluid, and ordered to be afterwards fomented and washed by a weak solution of liq. sodæ chlorinat. The routine treatment of liq. sod. chlorinat. and quinine with opium prescribed. The patient, whose general health seemed good, and who was not feverish, bore the operation well.

8*th.*—Temp. 100°, pulse 84. No pain; bowels regular; urine and lochia normal.

9*th, Morning.*—Temp. 99°, pulse 80. Lochia normal; no pain. *Evening.*—Temp. 102°·4. To have grs. 10 of quinine to-morrow morning.

10*th, Morning.*—Temp. 100°, pulse (in sitting posture) 100. Lochia normal; general condition very good; no pain. Feverishness probably due to irritation of breasts, or to malaria. *Evening.*—Temp. 103°. Continue as ordered yesterday.

11*th.*—Temp. normal, pulse 84. Bowels regular; lochia normal;

no abdominal pain or hardness. Wishes to go home. Discharged. Prognosis favourable.

III. *Rickets.*—M. G., æt. 27 (?), primipara, Mohammedan (Hindustani), admitted 11th January 1884 at 2 P.M. This is her first pregnancy, and it is at the 8th month. The patient, a rickety, poverty-stricken creature, was admitted in a most filthy and miserable condition, and very exhausted. Temp. 101°·6, pulse 154. Has had fever and cough for twelve days, and soon after admission had a shivering, and an examination of the chest showed pneumonia of the left lung. On p. v. cord found prolapsed and pulseless; os dilated to about size of an Austrian dollar; membranes ruptured; head presenting in 3rd position, with left arm. The antero-posterior diameter at outlet diminished by excessive curvature of sacrum to 1½ inches. Fœtal heart sounds inaudible. She was given some brandy and nourishment, and when somewhat restored I perforated the head, and rapidly delivered by guarded crotchet. The after treatment was antiseptic lotion and quinine and opium.

14*th.*—Temp. normal, pulse 100. Lochia normal. Cough very troublesome. Transferred to a medical ward, and eventually discharged well.

IV. *Osteomalacia.*—R. M. K., multipara, æt. 35, caste Mohammedan (Bhora), admitted 12th Feb. 1883, 5 P.M. Labour pains commenced at 4 A.M. on 10th, and continued till noon to-day, when they became feeble, speedily ceased, and she was brought to hospital at 5 P.M. Her condition then was as follows:—There is extreme anæmic pallor and general anasarca, urine albuminous, and she is anxious and desponding; temp. normal; pulse 104; fœtal sounds inaudible; labia much swelled by œdema and pale; cord prolapsed, livid, cold, and pulseless; vagina hot and swollen; head felt in first position above brim, and with some caput succedaneum; membranes ruptured, no pains, conjugate of brim diminished to about 1¾ inches, and some lateral contraction. The child being dead and the diameters so small, obviously craniotomy was the proper operation. At 7 P.M. the head was easily perforated, and I seized the head first by the guarded crotchet and then by craniotomy forceps, by which I removed portions of the parietal bones, but could not draw the head past the obstruction. I then tried traction by the blunt hook fixed successively in the orbit and the posterior nares, but failed to move the head. The cephalotribe I could not use efficiently owing to the extreme deformity at the brim, but I got a good hold of the base by the guarded crotchet, one blade of which I passed into the mouth and fixed in the posterior nares, and the other was applied to the base of the skull through this perforation, and with some difficulty and by

pulling the face in part I succeeded in completing delivery of the head. There was no difficulty with delivery of the body or placenta.

The operation lasted 1½ hours, and at its close the patient was much exhausted, and the pulse 160. I gave her an injection of ether subcutaneously with much benefit.

13*th.*—Temp. 98°·4; pulse 128, of good volume; slept pretty well; urine abundant, lochia normal; swelling of labia and of lower extremities diminished; general condition favourable. Prescribed a diuretic mixture and quinine with opium.

14*th.*—Temp. 103°, pulse 136; urine abundant, lochia normal; slept well; takes food and nourishment well; slight abdominal pain. Prescribed steel with ammon. chlorid. and digitalis, also 20 grs. of quinine.

Vesp.—Temp. 100°, pulse 132; bowels moved by enema.

15*th.*—Temp. 99°, pulse 120; lochia normal; slept well. Continued mixture and quinine.

17*th.*—Temp. 100°·8, pulse 108; lochia scanty, but healthy; dropsy diminishing; bowels regular.

On the 18th, and again on the 19th, she had attacks of fever with some looseness, and the lochia were offensive.

20*th.*—Temp. normal, pulse 102; tongue white and moist; lochia less offensive; no abdominal pain or tenderness.

She now asked permission to go to her own house, and was discharged. Prognosis on the whole favourable. The fever on the 18th and 19th was, I think, malarial.

V. *Osteomalacia.*—S. C., æt. 25, Mohammedan (Deccan), admitted Feb. 23, 1883, at noon. This is her fifth pregnancy, and all previous labours were natural and at full time. Pains began about noon yesterday, and have continued since with the usual intermissions. Fœtal heart sounds inaudible. Temp. 101°·6, pulse 140.

On vaginal examination, ant. post. narrowing to 2½ inches, and also lateral narrowing; membranes ruptured; os dilated; vertex presenting in first position. Fœtal heart sounds heard up to 1.30 P.M. but not after that. Craniotomy was performed in the usual way at 4 P.M., and after the brain had been evacuated, traction was made by the guarded crotchet. Slight laceration of the vaginal portion of the cervix was caused.

Treatment, antiseptic lotions and quinine and opium.

Vesp.—Temp. 102°, pulse 136.

25*th.*—Temp. 98°, pulse 80; no abdominal pain, but complains of pain in the upper and inner aspect of left thigh.

27*th.*—Temp. 99°, pulse 80; lochia normal; no pain in leg.

28*th.*—Temp., pulse, and lochia normal. Discharged.

Name and Caste.	Age.	Term.	Admitted.	Labour began.	Delivery.	Presentation.	Operation.	Pelvis.	Remarks.
1. J. A., Mohammedan (Shekh), Osteomalacia.	15	Full.	1883. Jan. 7.	1883. Jan. 4.	1883. Jan. 7. 6.30 P.M.	Vertex, 1st.	Craniotomy.	Conjugate 2¼ inches.	Primipara. Fœtus alive on admission. A puny child-like creature unable to extend thighs. Temp. 100°·8; pulse 120. A dirty offensive discharge from vagina. Discharged Jan. 17. Prognosis good.
2. I. D., Hindu (Mahratta), Rickets.	21	Full.	Feb. 6.	Feb. 3.	Feb. 6. 3 P.M.	Vertex, 3rd.	Craniotomy.	Rostrum shape, transverse of outlet 1½ inches.	Craniotomy on Dec. 8, 1879. Angular curvature of spine, projection of promontory of sacrum diminishing conjugate of brim. Approximation of iliac spine and tubers. diminishing transverse of outlet to 1½ inches. Three days in labour. Os and cervix rather rigid. Discharged Feb. 11, 1883. Prognosis good.
3. N. S., Mohammedan (Hindustani), Rickets.	30	Premature, eighth month.	Feb. 11.	Feb. 10.	Feb. 11. 4.30 P.M.	Vertex, 3rd, left arm funis.	Craniotomy.	Ant. post. outlet 1½ inches.	Primipara. Fœtus dead. Anæmic. Puffy Pneumonia of left lung for ten days. Thighs flexed and fixed. Temp. 101°·6 F.; pulse 160. After operation transferred to medical ward. Recovered.
4. R. K., Mohammedan (Bhora) Osteomalacia.	35	Full.	Feb. 12.	Feb. 10.	Feb. 12. 9.30 P.M.	Vertex, 1st, funis.	Craniotomy.	Conjugate of brim 1½ inches.	Multipara. Fœtus dead. Urine albuminous. Trunk and lower extremities œdematous. Face puffy and pallid. No fever. Pulse 105. Great difficulty in extracting head. Discharged Feb. 20. Prognosis doubtful or perhaps favourable.
5. L. S. C., Mohammedan, Osteomalacia.	25	Full.	Feb. 23.	Feb. 21.	Feb. 23. 4 P.M.	Vertex, 1st.	Craniotomy.	Conjugate of brim 2½ inches, also lateral contraction.	Multipara. Three days in labour. Fœtus dead. Temp. 101°·6 F.; pulse 140. Cervix rather rigid. Slight laceration of vaginal part of cervix. Discharged Feb. 28. Prognosis good.
6. J. M., Mohammedan (Benares), Shekh.	22	Full.	March 24.	March 22.	March 24. 7.15 P.M.	Vertex, 1st.	Craniotomy.		Primipara. Temp. 99°; pulse 120. In labour two days. Soft parts swollen. Ant. post. and lateral narrowing of brim and outlet. Forceps failed. Discharged April 4.
7. J. G., Hindu (Mochi).	22	Full.	March 31.	March 30. 5 P.M.	March 31. 12.10 P.M.	Vertex.	Version, forceps, craniotomy.		Multipara. In good condition. Version and forceps tried and failed. Some hæmorrhage before delivery of head. Discharged April 11.
8. K. E., Mohammedan (Shekh).	17	Full.	April 11.	April 10.	April 11. 9.15 P.M.	Vertex, 1st.	Craniotomy.		Primipara. In labour 1½ days. Membranes ruptured 24 hours. Fœtus dead. Pulse 150. Extremities cold; face sunken. Os and cervix rigid. Slight pelvic deformity. No difficulty in operating. Never rallied, and died at 7 A.M. on April 12.
9. B. A., Mohammedan.	19	Full.	April 26.	April 26.	April 26.	Vertex, 2nd.	Craniotomy.	Conjugate of brim about 2¼ inches.	Multipara. Craniotomy Feb. 13, 1882, when there was slight post partum hæmorrhage. Temp. 99°; pulse 110. Forceps failed. Slight post partum hæmorrhage.
10. K. M. K., Mohammedan.	28	Full.	June 27.	June 26.	June 27.	Vertex, 1st.	Craniotomy.	Conjugate 2½ inches, lateral contraction, rostrum shape.	Multipara; 1 still-born. Temp. 100°.; pulse 120. On admission a superficial laceration of vagina observed.
11. I. S., Hindu (Mahratta).	25	Full.	June	June 16.	June 19.	Face, 4th.	Craniotomy.		

HEAD MEASUREMENT.

O. M.	O. F.	S. O. B.	B. P.	B. T.	T. B.	M. F.	Fronto-mental.
5	4½	4	4	3½	4	1⅝	
5½	5	4	4	3½	4¼	1½	4
5½	5	4¼	4	3½	4	1⅞	4¼
5¾	4¾	4	3¾	3¼	3½	1⅝	
4¾	4½	3⅞	3½	3	4	1⅝	
5¼	4½	3¾	3½	3¼	3	1¼	

Average sup. maxillo-frontal diameter = 1·58 or 1⅝ inches.

Professor Simpson was sure the Society was much indebted to Dr Arnott for his interesting communication, which was specially valuable as giving some indication of the nature of obstetric practice in the East. He had little doubt that Dr Arnott had seen more cases of craniotomy in his Eastern practice than the whole of the Fellows of the Society put together. Dr Arnott's observations regarding the size of the fœtal head deserved special attention, and it ought to be noted how this matter should modify prognosis. Müller had shown that in certain Swiss districts there was found a frequent occurrence of justo-minor pelvis; but, at the same time, this was associated with small heads; and this ought to be carefully borne in mind in considering the question of the best method of breaking up the head. Dr Arnott favoured the method of breaking up the vault, and then tilting the head so as to take advantage of the readiest method of extraction; and there can be no doubt that this method is sufficiently satisfactory in cases where we have to do with a comparatively small head. The operation is, however, a very tedious one, and demands patience and skill on the part of the operator, whereas an operation which effects direct breaking up of the base saves the slow crushing up of the vault. This direct action on the base is effected by means of the basilyst, and this can be employed as a perforator for opening into the skull; and since the comminution of the base is effected from within, it enables us to avoid the risk to the maternal passages from laceration by projecting spicules of bone. Dr Simpson agreed with Dr Arnott that it would be well if the instrument could have an addition for crushing and traction as well, and he had already added such to the new model of his basilyst, which he hoped to have shown to the Society to-night. It was interesting to note that the current of opinion both in Germany and France was going in the direction of developing cranioclasm rather than cephalotripsy. Basilysis and cranioclasm combine to produce the

character of the head of a fœtus dying in utero, and expelled after being subjected to softening and putrefying processes.

Dr Angus Macdonald was delighted to hear Dr Arnott's paper. It gave an account of his experience in a direction in which we seldom met with opportunities here. In this country one never came across such cases as Dr Arnott describes. It is rare to meet with a pelvis of less than 2½ inches conjugate. He agreed with Dr Simpson's remarks as to the action of the basilyst. He has, however, a theoretical difficulty regarding it, namely, the difficulty of making sure of the direction in which it was being driven in relation to the maternal parts. If it passes in the direction of the vertical axis of the child, then it can do no harm; if it does not do so, it could scarcely fail to penetrate the mother's tissues, and its use would be attended by disaster. He has had no experience, however, in its use, and perhaps this theoretical difficulty would vanish in practice.

Dr Underhill had the same difficulty in speaking of these cases on account of the rarity of one's experience of them in this country. He had listened with much pleasure to the paper, and was pleased to learn Dr Arnott's experience with the guarded crotchet. He had himself on one occasion failed to extract with the cephalotribe, though it had been applied successively in several ways, but had succeeded by employing the crotchet in the same manner as Dr Arnott described. He thought Dr Arnott was especially to be congratulated on the eminent success of his treatment.

Dr Ballantyne had measured several heads in the Maternity, and found that the average distance from the glabella to the alveolar margin of the upper jaw was 1⅝ inch. The largest measurement obtained was 1⅞ inch, and the smallest 1¼ inch. These measurements seemed to show that even in the case of European children the head might, in cases of great narrowing of the brim, be dragged through, face first, as Dr Arnott had done.

The President was much pleased to hear the account of these interesting cases. He had had himself one case of craniotomy and another of cephalotripsy. He certainly would in any similar case which might come under his care employ the basilyst at once, and allow the bones to mould to the maternal passages. It seemed to him that the operative procedure ought to be directed to enable the head to enter the contracted portion of the pelvis, and then allow nature to complete the delivery as far as possible.

Dr Arnott thanked the Fellows for their reception of his paper. He would like to remark on the great frequency of osteomalacia among Mohammedan women, and its comparative rarity among Hindoos. The latter are as much exposed to malacia as the former, and yet the Mohammedans show the deformity much more frequently than Hindoos. In breaking up the head he did not remove by any means all the bones of the vault, but trusted to his being able to deliver by tilting the head sufficiently far back.

There was some difficulty in determining the absolute facts as to the ultimate results of his cases, as the patients always left at the earliest possible opportunity; but with the single exception of one case, he felt quite sure that the history as stated was quite correct.

MEETING II.—DECEMBER 10, 1884.

Professor ALEX. RUSSELL SIMPSON *in the Chair.*

I. *Dr D. Wilson* showed PLACENTA, from a case of placenta prævia.

II. *Dr Angus Macdonald* showed (1.) A LARGE CYST, removed from the left broad ligament. The cyst was unilocular, and contained 17 pints of clear fluid, giving a slight cloud on addition of nitric acid, and a copious white deposit with nitrate of silver. The pedicle was a long, narrow one, twisted, and it arose from the anterior surface of the broad ligament, close to the ovary, but the ovary did not form part of the pedicle. The left ovary was also removed on account of its being cystic. (2.) RIGHT OVARY AND OUTER PORTION OF BROAD LIGAMENT, removed from the same patient; the ovary was cystic. In the broad ligament, between its layers, in the situation of the parovarium, there was developed a small cyst, evidently one of the parovarian tubules distended. (3.) Dr Macdonald showed for Dr H. Peddie the OVUM of a patient with a history of missed miscarriage. Round one of the legs of the fœtus the umbilical cord had fixed itself in a firm knot, which was thought might account for the death of the fœtus.

III. *Dr Skene Keith* showed a FIBROID UTERUS, which illustrated the difficulty, in some cases of fibroid tumour, of removing the ovaries, owing to their altered position, due to the rotation of the uterus and the fixation of one or both in some part of the pelvis.

IV. *Professor Simpson,* in showing his BASILYST-TRACTOR (see Fig. 1.), observed that the instrument was calculated to accomplish any of the stages that might be found necessary in any case of head-reduction and extraction. In some cases perforation of the vault was required, and that alone. With the basilyst an opening could be made in the calvarium, round and smooth, like that produced by a trephine. This was effected by simply screwing in the point of the instrument as far as the shoulder, and then withdrawing it. Commonly, however, a more extensive gap would be required, and this could be secured by compressing the spring-handle of the instrument, and so separating the points as to bring about a wide dilaceration of the flat bones of the exposed part of the skull.

Where perforation of the vault did not give sufficient diminution in the bulk of the head, the basilyst gave, further, the safest and

Fig. 1.

easiest method of securing the necessary comminution and collapse of the whole skull. For the point of it could now be carried into the cranial cavity and screwed into the hard, unyielding base. It had been suggested that the danger might be present at this stage of the operation of perforating not only the bones of the skull but the soft structures, and so reaching the internal surface of the uterus. Of course, such a danger could be imagined. But unless the point of the basilyst were directed to some point in the skull above the level of the ears—and no practitioner would be likely to make this mistake—such an accident could not possibly occur. Screwed in up to the shoulder, the point of the instrument could not go beyond the skin of the fœtus, and by compression of the handles, the hard bones of the face were torn apart.

In experimenting recently with Dr Barbour on the head of a child that had become hardened to a considerable degree through lying long in spirit, he had found it difficult with the original basilyst to compress the handles with sufficient power to separate fully the points. In the new instrument the screw apparatus which was required for the traction-blade was made capable of adaptation to the spring-handle also. The power of the screw was thus made available for the dilaceration of the bones of the base, although he (Prof. Simpson) had never found difficulty in tearing up the bones of a recently dead fœtus by manual compression of the handles. In many cases such a dialysis of the basic bones as could be thus effected with the basilyst would allow of the easy transit of the now softened and mouldable head through a contracted pelvis. But the instrument which he now laid before the Society had the power of producing still further comminution of the head.

As the Fellows could see, the new instrument was provided with a blade resembling the external blade of an ordinary cranioclast. This could be applied outside the head, over the face or the occiput, or the sides of the head, according to circumstances, while the basilyst with its point fixed in the base served as the internal blade of a cranioclast. When the screw at the handle was fitted into the notch at the end of this new compression

blade, a more thorough crushing of the bones of the skull could be secured than was possible with any cranioclast. If it were found necessary, after crushing the head in one direction, the external blade could be shifted and applied in the opposite direction, and so a compression produced equal to the compression of M. Tarnier's basiotribe.

Where further activity was indicated, and the operator found himself under the necessity of proceeding to the third stage of extraction of the head, the instrument with which he had effected the comminution gave him also the requisite power for traction and moulding of the head to the form of the pelvis. It was with the view primarily of thus fitting the basilyst for extraction that he (Prof. Simpson) had added this traction-blade to the instrument; and though it was no unimportant addition to the usefulness of the instrument that this blade increased its power as a comminutor, yet the chief value of it lay in its enduing the basilyst with the same power at once of securely grasping the head and of elongating and adapting it to the parturient passages which had made the cranioclast the favourite extractor.

The screwing apparatus was removable, and the tip of the wing of the screw-nut could be used as a screw-driver for taking out the pin of the joint. The instrument could thus be taken easily to pieces and thoroughly cleansed after every operation in which it had been employed.

V. NOTE OF A CASE OF MEASLES COMPLICATING PREGNANCY AND PARTURITION.

By Angus Macdonald, M.D., F.R.C.P. Ed., F.R.S.E., Physician and Clinical Lecturer on the Diseases of Women, Royal Infirmary; Lecturer on Midwifery and Diseases of Women and Children, Medical School, Edinburgh.

For some time back there has been occasionally heard in the Society a sort of grumble that the character of the papers produced for it by some of us is too heavy and too elaborate, and that the usefulness as well as the agreeableness of the Society would be added to by the admixture occasionally of short notes referring to interesting subjects, which might form material for free and easy discussion. As I stand convicted of having sinned, if the production of somewhat lengthy papers be regarded as a sin, I have tried to make the best amend in my power by meeting the objectors on their own ground, and accordingly I take the liberty of reading to the Society the following note of a case of pregnancy and parturition complicated by measles which may, I hope, be interesting to some of the members of the Society, as it is an undoubtedly rare complication of these conditions:—

Mrs Y., æt. 26, I^{a}, residing in Edinburgh, and expecting her confinement on the 22nd of June 1884, had the misfortune to have measles in her house in the month of May, a little stepson having

caught the disorder. This patient was assiduously watched by her for a couple of days until the measles appeared. The lady herself was not aware of having had measles herself. She accordingly was at once removed to another floor of the house, and on the following day to rooms in a part of the city distant from her home 1½ miles.

June 5th.—A full fortnight after removal she had some sore throat and sneezing, and along with these symptoms the rash of measles appeared on her skin. Her morning temperature was 99°·6, her evening 102°.

June 6th.—The measles are very well out all over the body. Slight cough. Temperature as on the previous day. During the night the patient complained of some pains in the back.

June 7th.—At morning visit the cavity of the cervix was found completely dilated, and the outer os about the size of a shilling, the child's head being pressed against it, covered with a thin layer of water. The morning temperature was 99°·5, the evening 100°·2. In the course of the night labour became fully established.

June 8th.—At 5.25 A.M. the patient was delivered of a healthy female child. During the delivery she complained of a distressing feeling of weakness, and of a sensation of faintness. The pulse was quick and small. Some chloroform was given during the second stage, which was easy, and did not last over two hours. There was smart post-partum hæmorrhage, which was checked by the exhibition of ergotin under the skin before the placenta was removed, and by kneading the uterus. The temperature shortly after delivery was subnormal. Brandy had to be repeatedly administered after delivery to check the feeling of faintness and sickness. In the evening the temperature rose to 100°·2. The patient made an uninterruptedly good recovery, the temperature never afterwards reaching over 100°. The milk appeared naturally, and the entire puerperium exhibited nothing to be specially remarked upon.

About the end of the first week of life the baby showed a distinct punctated rash, which may or may not have been measles, but which was unaccompanied by any rise in temperature or pulse.

After the scholarly contribution and masterly analysis of cases of this complication lately brought to the notice of the Society by Dr Underhill, it is quite unnecessary for me to go back on the literature of the subject further than to refer the members of the Society to that paper. As cases of this kind are, however, so very rare, it is incumbent upon all members to record them for the public benefit.

It will be noticed from the above record that the case was, on the whole, a very mild one, and was free from any chest complication. But all the same, it was evident that the labour was precipitated by the fever, as the 22nd of June was the earliest date on which, by careful analysis, we had calculated the labour

would come on, whereas it supervened on the third day after the appearance of the rash, or what would be the seventh day of the fever, although this was sixteen days before the period of expected delivery. It is also noticed that the double demand upon the patient's strength made by the fever and the labour was specially marked in its power of inducing depression. The complaint of excessive weakness made both before and after the administration of chloroform were exceedingly unusual.

Being aware of the special tendency to hæmorrhage determined by measles, I had the ergotin ready in the syringe, for use the moment the child's head was born. I had forceps ready also in case the second stage was unduly or unsafely prolonged. But I did not need to use the latter. There was no bleeding before the birth of the child, or any other evidence to indicate hæmorrhagic endometritis properly so called. But there was certainly a special tendency to post-partum hæmorrhage which might have led to serious consequences, had it not been checked by the injection of ergotin.

From a consideration of this case, and, indeed, from a review of the whole matter, it appears to me that measles are not to be dreaded so much in connexion with pregnancy as we have hitherto considered them. Such of us as were trained by Sir James Y. Simpson—and his pupils still form a large proportion of this Society—have framed our ideas of measles in connexion with pregnancy rather too closely on the type of the case he used to relate to us. That particular case assumed the form of intense septicæmia. I am not perfectly satisfied that the case was one of measles, as no rash came out, and the evidence from the child's having ultimately exhibited a measly rash can hardly count for much, considering the frequency with which infants suffer from such rashes where there is no possibility of infection. At any rate, from the two cases which have come under my own knowledge there is no evidence to indicate that the measles poison tends to act as a general septic influence in pregnancy or in the puerperium.

It appears to me that measles are dangerous in pregnancy and the lying-in period—

1. Because they have an undoubted tendency to produce abortion.

2. Because they are associated with a tendency to pulmonary inflammation.

3. Since the delivery, if it supervenes, is undergone when the patient is already weakened by fever, it is peculiarly liable to weaken and exhaust the patient.

4. Because measles have an undoubted tendency to induce hæmorrhagic endometritis.

Provided, however, chest complications are absent, or moderately developed, the delivery is completed by the natural efforts,

or by aid of art, before the condition of exhaustion becomes dangerous, and the hæmorrhagic tendency is in abeyance, it does not appear that measles need be looked upon as a complication of pregnancy or of parturition that should cause especial alarm.

Professor Simpson had seen the case recorded by Sir James Simpson and referred to by Dr Macdonald, and could assure him that his suggestion that it was any other than a case of puerperal death from measles was utterly unwarranted. He remembered witnessing the autopsy made by Professor Turner in presence of a medical brother-in-law of the deceased lady, and the autopsy entirely confirmed the diagnosis that had been made during life; and when Sir James related the case to the Society, none of the Fellows present had any doubt as to its nature. The case had made a very deep impression on his (Prof. Simpson's) mind, and he retains the strongest opinion as to the risk a parturient woman may run who is exposed to an attack of measles. He quite admitted that the disease was not to be regarded as of equal gravity in all cases, and that it was not to be compared in its degree of danger with a puerperal scarlatina. The relation of puerperal patients to these zymotic diseases differed with the susceptibility of each individual patient. It could, perhaps, be most easily traced in the case of smallpox. During a smallpox epidemic pregnant and puerperal patients ran the risk of infection, less or greater, according as they had or had not been efficiently protected by vaccination or a previous attack of the disease; and when it seized on a patient unvaccinated on her first exposure to the poison about the date of her full-time delivery, the chances were she would succumb. The same thing held good with regard to measles, though here, of course, we have to do with a less fatal malady. Cases have been known of women being confined in the same bed with their scarlatinous children without fevering. But Sir James Simpson's patient had been an only child, carefully isolated through all her childhood, so that she had escaped exposure to measles until it came amongst her children, just when her thirteenth child was nearly due. And the value of the case lay in the demonstration it afforded of the danger this least fatal of the zymotics introduces into the lying-in room. For though the children all recovered easily, and even the new-born infant, the mother died the third day after labour. Dr Macdonald's case taught nothing, as it was not even certain that the patient had not previously had measles; and if he meant the profession to draw from his narrative the only logical conclusion, that stringent quarantine round pregnant and puerperal women was unnecessary in a measles epidemic, then he (Prof. Simpson) thought it would lead to practice that might be dangerous in a high degree.

Dr Wilson remarked that it was so far a fortunate circumstance that most women had had measles before they came to be pregnant,

and that this might account for the rarity of its occurrence among women in this condition.

Dr Rattray had had much pleasure in listening to Dr Macdonald's paper. It reminded him of a patient, a lady, whom he met one day some years ago, and he observed at once the characteristic appearance of commencing measles. He advised her to go to bed at once, and in a short time she developed somewhat serious symptoms of bronchitis, but ultimately got well.

Dr Craig stated that measles accompanying the puerperal condition must be very rare, as out of a very large number of cases of midwifery he had not met with a single case of measles in childbed. This might be due in part to what had already been stated, that most women have had measles in infancy. He met with a case many years ago in which a woman was delivered in a bed in which were two of her children lying with the eruption of measles well out, but the mother did not take the disease. She was not sure if she had had measles in infancy. He also mentioned that during the last epidemic of smallpox in Edinburgh he was summoned to attend a gentleman suffering from smallpox, and as his wife was daily expecting her confinement, he at once vaccinated her. Both vesicles did well, and she was confined eight days afterwards, having nursed her husband till the day of her confinement. Of course she was confined in a separate bedroom, but in the same house. She made an excellent recovery, and did not take smallpox. Dr Craig vaccinated the child the morning after it was born, and the vaccination was successful. On the eighth day, however, smallpox manifested itself, and the child survived, not, however, without being considerably marked with the effects of the disease. The child was a female, and both breasts suppurated from the effects of the disease.

Dr Macdonald stated he was pleased with the remarks which had been called forth. He formed his opinion of Sir James Simpson's case by reading of it, and quite agrees at the same time with Professor Simpson's precautions as to quarantine. He was, however, convinced that the danger to a pregnant woman from exposure to infection of typhus, typhoid, etc., had been over estimated. Unless from concomitant complications these diseases were by no means necessarily fatal. They may go on well, and make an excellent recovery. What he meant most to bring out was simply that, while admitting such complications to be grave, they were not so grave as had been made out.

VI. NOTE ON A CASE OF DIMINUTION OF ALBUMINURIA IN PREGNANCY COINCIDENT WITH THE DEATH OF THE FŒTUS.

By A. H. Freeland Barbour, M.D., F.R.C.P. Ed., Assistant to the Professor of Midwifery and the Diseases of Women.

The following case appears worthy of being recorded :—A. B., æt. 21, enjoyed good health up to her marriage last December. Three months after marriage she had an abortion at two and a half months. During this pregnancy there were no symptoms worthy of note. After one menstrual period she conceived again. About the fourth month she noticed swelling of the feet, which gradually increased until she could no longer wear boots. As the swelling affected also the face and other parts of the body, she came to Professor Simpson to seek advice. She was then about seven months pregnant. The fœtal heart was quite distinct. There was great œdema of the lower limbs and abdominal parietes, and the urine contained three-quarters albumen. Unfortunately, it was not examined by the clerk in charge for tube-casts. Milk diet was prescribed with tincture of perchloride of iron. She returned after a week's interval with the œdema as marked as formerly, and the urine still containing about three-quarters albumen. She had been unable to keep rigorously to the milk diet.

A fortnight afterwards I saw her at her own house, and was surprised to find that the œdema had entirely disappeared. She said it had gradually gone away since her last visit, and she had not come to report herself at the Infirmary. On testing the urine, it contained only a slight trace of albumen. Repeated examination could detect no fœtal heart sounds, and movements had not been felt for at least a fortnight. On the following day labour came on, and the patient was rapidly delivered of a fœtus about the size of a seven months' one. It had evidently been dead some time, as the skin was peeling. During the puerperium the urine showed some increase in the albumen again, which may have been due to the lochial discharge, as it was not drawn off with the catheter.

In this case there was then two facts: a rapid diminution of the albumen in the urine, which fell from three-quarters to a mere trace, with disappearance of an extensive œdema. About the same time as this occurred the fœtus died in utero. The question that at once suggested itself was: Is this a mere coincidence, or is there a connexion between these facts. I have looked up the literature of albuminuria during pregnancy, and find the following references to this occurrence. Dr Underhill mentioned a similar case to the Society some years ago. As it was not published then, he has kindly given me the following note of it:—"The case I mentioned to the Society some time ago was briefly as follows:—A married woman, aged about 34, who had had four labours at the

full time, and one or two miscarriages after the last child was born, came under my care in 1878. She told me that she had been pregnant two years previously, and had been so ill with albuminuria, headaches, sickness, and general impaired health, that abortion was induced at the third or fourth month. When I first saw her she had occasionally a small quantity of albumen in her urine, often a mere trace, sometimes none at all. She became pregnant in the end of August 1878, and from that time the albumen began to increase in quantity, until about the New Year time it was about $\frac{1}{6}$ to $\frac{1}{8}$ of the urine. Her health was deteriorating *pari passu*. She had headaches, anæmia, and sickness, and we seriously debated the propriety of inducing abortion, but deferred it in the hope that some change for the better might take place. About the middle of January the fœtus died, and from that time onward the general health showed marked and progressive improvement, and the albumen rapidly diminished. She miscarried early in March 1879 of a dead fœtus of about $4\frac{1}{2}$ months, and which had all the appearance of having been dead some weeks. At this time the albumen had almost entirely disappeared. She never became pregnant again, and her husband died a year or two afterwards. She is now (1884) in fair health, and I have found no albumen the last time or two on which I have examined the urine."

Leishman gives in a footnote to his last edition a case mentioned to him by Dr J. D. Maclaren, in which albuminuria appeared at the sixth month, and continued to the eighth, when suddenly profuse diuresis set in, accompanied with disappearance of the dropsy and albumen. A week afterwards, a dead child was born, which seemed to have died at the time the diuresis occurred.

Spiegelberg also mentions a case of albuminuria in a case of extra-uterine gestation, in which it and the dropsy disappeared after the death of the fœtus.

These four cases are, so far as I know, all that have been placed on record.

From a few cases we are not justified in drawing any conclusions. If a sufficient number of cases are observed to show that the occurrence of diminution of albuminuria with death of the fœtus in utero is more than a coincidence, a reasonable inference would be that the albumen in the urine is affected by the life of the fœtus, *i.e.*, that in some cases albuminuria is due to a condition of the maternal blood induced by pregnancy. As the mechanical conditions with regard to the pressure of the uterus on the ureters remain the same from the death of the fœtus to its expulsion, the diminution of the albuminuria in the cases referred to goes against the theory which accounts for the albuminuria by this pressure.

In connexion with this subject, I may refer to a paper by

Levret on varix and œdema during pregnancy, in which he shows that these conditions improve when the fœtus dies. From this he concludes that they are in some cases due to the condition of the blood produced by pregnancy.

Dr Macdonald was delighted to listen to this case, and to Dr Barbour's valuable references to the literature. He would have been glad to have made a contribution to our knowledge had he met with an instance. He has no recollection of any such coincidence, unless the following one, which he saw with Dr Affleck. The patient at the eighth month had œdema and convulsions. He gave chloral, and all symptoms disappeared. He had some doubt as to whether the albumen disappeared entirely. The patient went on to full time, and delivery occurred without any complication.

VII. *The Secretary* read the following paper:—

ON THE PREVENTION OF LYING-IN FEVER.

By Vassily Sutugin, M.D., Physician to the Court of H.M. the Emperor of Russia, Lecturer on Midwifery and Gynæcology at the Imperial Medico-Chirurgical Academy of St Petersburg. Translated from the Russian by G. L. Carrick, M.D.

The high rate of mortality that had long been observed to follow childbirth—greatly exceeding the number of deaths from cholera and smallpox together—and the futility of therapeutic remedies in combating puerperal fever, clearly proved that the efforts of the accoucheur should be directed towards discovering a means of preventing the disease. Some of the greatest minds in the profession throughout the civilized world have been trying to attain that object, and their united labours have been followed by results that, fifteen years ago, would have been considered unattainable. With the view of demonstrating these facts more clearly, I shall cite the rate of mortality before and after the introduction of a more careful prophylaxis (*i.e.*, the use of antiseptics) in the management of the puerperal state. Thus in Bischof's clinic in Bâsle the mortality in 1868 was 6·4 per cent., or 1 in 16; after the introduction of the antiseptic treatment in 1882, 1·6 per cent., or 1 in 63. In the Maternité in Paris, from 1858 to 1870, the deaths were 9·31 per cent., or 1 out of 11; since the introduction, according to the recommendation of Professor Tarnier, of certain prophylactic remedies—such, for instance, as the exclusion of pupils who had been assisting at post-mortem examinations, and the employment of certain antiseptics—the mortality fell, from 1870 to 1881, to 2·32 per cent., or 1 in 43. According to the latest reports, the death-rate was 1 per cent., or 1 in 100. In a

private ward of Professor Tarnier the mortality up to 1879 was barely 0·5 per cent., or 1 in 200; while, after the adoption of stricter prophylactic remedies, it fell to 0 per cent. out of 608 deliveries.

In the Paris Lariboisière the death-rate in 1862 was 7 per cent., or 1 in 14; after the introduction of antiseptics, in 1882, 1·6 per cent., *i.e.*, 1 in 63. In the Berlin Charité, according to Gusserow, the mortality, prior to the use of prophylactics, *i.e.*, from 1859 to 1860, was 16 per cent., or 1 in 6. Subsequently, after the employment of certain disinfecting remedies, in accordance with the teaching of Ign. Semmelweiss, it fell, in 1874, to 4·4 per cent. With a still stricter prophylaxis, it was reduced, in 1881, to 0·9 per cent., or 1 in 111. The results were the same in most of the clinics and lying-in hospitals of Germany. At the present moment, in many of them the percentage of deaths keeps at about 0·5 per cent. In St Petersburg, according to the reports of the Lying-in Hospital in connexion with the Foundling House, the death-rate, from 1870 to 1871, was 3·7 per cent. In 1873 it was 3·5 per cent.; in 1875, 0·7 per cent.; in 1876, 0·8 per cent.; *i.e.*, before there died in childbirth 1 out of 27, while after the adoption of certain prophylactic measures there died but 1 in 143.[1] Although the death-rate is not a fully just criterion of the well-being of lying-in hospitals, yet it supplies us with a pretty fair means of judging the comparative merits of the different remedies employed for preventing puerperal fever.

The use of prophylactics after delivery has been intimately connected with our gradually acquired knowledge of the nature of so-called puerperal fevers, as well as with a more intimate acquaintance with the process of putrefaction and the methods of preventing such putrefaction (antiseptics). The first clear idea of the nature of puerperal fever was enunciated by the illustrious Semmelweiss in 1847. He also was the first to direct attention to preventive measures. The essence of his teaching was, that puerperal fever is the result of the introduction of putrefying matters (particularly those of decaying animal bodies) into the wounded generative organs of the child-bearing female. But although he succeeded in gaining over to his side such eminent contemporaries as Skoda, Rokitansky, and Michaelis, yet, owing to many extraneous circumstances, he was unable to spread his teaching sufficiently far and wide. The proof of the wonderful influence he had on some of his followers is seen in the tragic end of Michaelis.[2]

[1] In the lying-in hospital to which I am attached the deaths during the first four years equalled 0·8 per cent.; after I resorted to the strictest prophylaxis, it fell to 0 per cent.

[2] Dr Michaelis, after having made a post-mortem in a case of death from puerperal fever, delivered a relative of his, who succumbed to the same malady. Considering himself the murderer of the deceased, Michaelis committed suicide by throwing himself under a railway engine (Ignatz Semmelweiss *v.* A. Hegar, 1882, p. 18).

Semmelweiss' teaching did not take as firm root, however, and did not do as much good as its author expected,—probably because the learning of the day in regard to putrefaction was far inferior to his enlightened views. It cannot be said that his teaching fell into thorough oblivion; on the contrary, it was resuscitated on the appearance of every new epidemic of puerperal fever; and even with us (in Russia) before the spread in surgery of the Pasteur-Lister doctrines, it was particularly insisted upon at the meetings of our St Petersburg Obstetrical Society, and was warmly defended and propagated by Dr Hugenberger. Those accoucheurs who became believers in the teaching of Semmelweiss shunned post-mortem examinations, so as to avoid introducing a putrefactive poison into the system of those they attended in childbirth.

The introduction into surgery of the theory of blood-poisoning from without, and the prophylaxis of putrefaction in general, gave a new impetus to the placing of Semmelweiss' theory on a more scientific basis, coupled as it was with new methods of research. I do not consider it necessary here to enlarge upon the history of the growth of our present views regarding what is the essence of so-called puerperal fever, but will simply remark that at present the conviction is firmly established that puerperal fever, without constituting a specific disease, is simply a species of blood-poisoning, caused by the importation of putrefactive poison from without, or by the generation of such poison independently of any external agency within the patient's body, *i.e.*, auto-infection.[1]

The lying-in woman has been compared to a wounded individual, and most puerperal diseases are considered traumatic inflammations, in which case the wound may be self-constituted, *i.e.*, produced by the physiological progress of the labour, or artificial, *i.e.*, produced by the hand or instruments of the accoucheur. From this class of puerperal maladies, commencing as a rule during the process of labour, although evincing signs of their presence in from one to two days, were separated, the *later affections* dependent upon abnormal retrogressive development of the uterus, and the arrest of its discharges, and leading to so-called *auto-infection*, *i.e.*, cases of atonic womb.[2] These are still disputable forms of disease, although they undoubtedly differ from ordinary cases of blood-poisoning. In these cases, according to some authors, the germs

[1] Dr Tiede, "Ueber Atonie des Uterus, im Wochenbett," *Berliner Klin. Wochenschrift*, 1881, No. 39, p. 555. J. Veit, "Ueber Puerpurale Infectionen mit ängeser Incubation," *Zeitscr. für Gebürtshülfe und Gynæk.*, vol. vi. p. 378. Wiener "Uber Späterkrankungen in Wochenbett," *Centralblatt f. Gynækol.*, 1882, No. 11. P. Muller, *Archiv. f. Gynæk.*, vol. xx. p. 321.

[2] I have treated this subject fully and in detail in my *Report of the Lying-in Department of the St Petersburg Foundling Hospital for the year* 1882, p. 144; it has also been admirably handled by Prof. Rein in his lectures on "Antiseptics in Obstetrical Practice," published in the *Meditsinsky Vestnick* (*Medical Messenger*).

of the infection enter the generative organs several days only after childbirth, in consequence of incomplete closure of the generative track, while, according to others, the germs are conveyed during the process of labour, although, for reasons unknown to us, they do not show signs of their existence until seven, eight, or even ten days subsequent to parturition. To the third category of puerperal fevers must be referred cases of chronic peritonitis and suppurating salpingitis,[1] which pass into the acute stage from a simple (*i.e.*, without the introduction of putrefying matter) post-partum wound, but which run the ordinary course of blood-poisoning after childbirth. What are the qualities of the contagious putrefactive matter, *i.e.*, whether its action is chemical (belonging to the class of so-called ptomains), or whether suppurative micrococci (contagium animatum) play the chief part therein, is still an open question, in spite of the great efforts made to elucidate the subject. The discovery of micrococci by Waldeier[2] in peritonitic effusions, the lymphatic vessels, and the tissues of lying-in women who succumbed to *septicæmia*, and by Pasteur in their blood, as well as the artificial culture of these micrococci, and the inoculation of animals by Doleris,[3] Karewski,[4] and Prof. Chauveau,[5] have led to no decided results, although Doleris worked under the guidance of Pasteur, and Karewski under that of Virchow and Schröeder, and in the same city with Koch. One thing, however, has been made clear by their observations, viz., that the excitants of putrefactive contagion are really discoverable in the secretions and exudations of puerperal women. Karewski, in particular frequently found small, spherical, peculiarly characteristic micrococci, remarkable for their equality in size, while Doleris found that species of micrococci the most malignant which is distinguished by its large size and remarkable brightness (shininess). There has even been a special micrococcus described as the micrococcus puerpuralis first discovered by Coze and Fellz (Chauveau, *loc. cit.*), and inoculated on animals by Pasteur. Prof. Chauveau became so enthusiastic a believer in this specific micrococcus, that he even proposed employing it for prophylactic inoculation. But the observations of others did not confirm the existence of this micrococcus. Meanwhile, the experiments of Panum in regard to boiling putrefactive poisons, and also those of

[1] Fehling, "Ueber Schwere, nichtinfectiöse Puerpural Krankungen," *Centralblatt für Gynæk.*, 1883, p. 12. Voskresensky, "A Case of Intestinal Rupture," *Vratch*, No. 5, p. 75.

[2] Waldeier, "Bacterien bei Puerpuralfieber," *Archiv f. Gynæk.*, vol. iii. p. 293.

[3] Doleris, "La fièvre puerpurale et les organismes inferieurs," *Thèse de Paris*, 1880.

[4] Karewski, "Experimentale Untersuchungen über die Einwirkungen Puerpurale Secrete auf den Thierischen Organismus," *Zeitschr. f. Geburtsh. und Gynæk.*, 1882, vol. vii. p. 331.

[5] Chauveau, "Sur la septicemie puérpurale expérimentale," *Archives de Tocologie*, 1883, p. 52.

Rosenberger[1] and Zweifel,[2] speak in favour of the chemical action of suppurative poisons (of the ptomain order).

Leaving the final decision of this question in the hands of experimenters, the clinical physician or practitioner should at present base his practice upon his personal observations. The introduction of prophylactic measures against the possible influence of animated contagions (contagii animati) led to a decided diminution both of infection and of death-rate among child-bearing women. The same was observed in regard to all wounds, and the practitioner is therefore justified in accepting the theory *of puerperal fever being carried to the patient from without* (the extraneous theory), and *in doing his utmost to prevent the contagium animatum*, not forgetting, however, that the cause of putrefactive changes may also be chemical. Most modern authorities on midwifery believe the puerperal poison to be a *contagium animatum*,[3] while also acknowledging the possibility of infection from all putrefying matters. They do not, therefore, regard puerperal fever as a poison essentially *sui generis*, and transmittible only through one infected lying-in woman to another. Moreover, Spiegelberg[4] and Gusserow[5] (and I also incline to that opinion) acknowledge the necessity, for purposes of prognosis, of dividing puerperal disease into traumatic and putrefactive. The former is remarkable for its milder course and favourable termination, and the absence of signs which prove the introduction of putrefying matter; in other words, it is a non-putrefactive, inflammatory form of disease. The latter, or putrefactive class of these diseases, is distinguishable by the sharply-defined fever of septicæmia, or pyæmia, or the mixed form of septicopyæmia.

The extension of our knowledge of puerperal fever served to simplify the means of combating it; it became possible successfully to apply preventive measures. Modern obstetric literature abounds with prophylactic post-partum remedies. In our St Petersburg Obstetric Society a whole series of meetings and debates were devoted to this question. In my published report on the St Petersburg Lying-in Hospital, the necessity of applying antiseptic remedies during parturition was clearly pointed out; moreover, there appeared a translation of Zweifel's[6] pamphlet into Russian,

[1] Rosenberger, "Uber das Wesen des Septischen Giftes, Festschrift zür Feier des 400 Jährigen Bestehens der Julius Maximilian Universität zu Würzburg."

[2] Zweifel, "Untersuchungen über die Wissenschaftligen Grundlagen des Antisepsis und die Enstehung des Septischen Giftes," *Zeitschr. für Physiolog. Chemie*, vol. vi.

[3] Prof. Gusserow, "Ueber Puerpural Fieber," *Berliner Klinische Wochenschrift*, 1882, No. 32, p. 482. Also see author's statements, made eleven years ago, in his *Report on the St Petersburg Lying-in Hospital for* 1872, chapter on Puerperal Diseases, p. 370.

[4] Spiegelberg (*Berliner Klin. Wochenschr.*, 1881, No. 22, p. 309) considers use of drainage sensible, but of doubtful utility where the parts are regularly irrigated.

[5] Gusserow, *Berlin. Klin. Wochen.*, 1882, No. 32, p. 489.

[6] *How to Prevent Infection after Childbirth*, by Prof. Zweifel. Translated by Prof. Slaviansky, 1880. Designed chiefly for the use of midwives.

Dr Dobronravof's communication headed, "Lister's Principles as Applied to Obstetrics," and Prof. Rein's lectures *On Antiseptics in Midwifery.*

The anti-putrefactive (antiseptic), or, more correctly, the preventive method, consists of the sum total of a number of measures, ranging from the room in which the parturient woman is placed to the minutest details regarding the nursing of the patient. In obstetric antiseptics it is imperative not only to adopt all measures tending to destroy contagion from without, but also to remove all conditions that tend to encourage its development within the generative organs of the child-bearing woman.

In surgery, according to Professor Bergmann,[1] the adoption of the following four chief antiseptic measures (besides cleanliness of wards, instruments, and attendants) is considered necessary.

1. *The smallest hæmorrhage possible* into the wound, because the extravasated blood supplies nourishment to the excitants of putrefaction. (This end is attained by ligature of, or pressure on, the vessels.)

2. *Limiting the exudation of blood serum into the wound,* as it also serves as food for bacteriæ. (This is attained by drainage.)

3. *Bringing the incised parts neatly and firmly together* by careful stitching and absolute rest of the wound.

4. *The destruction of those excitants of putrefaction that are introduced from without.*

This latter condition is hardly attainable by Lister's, or by the improved dressing, as this dressing simply prevents the birth of new units of infection (spores), but does not kill those already present.

It stands to reason that the carrying out of all these antiseptic measures demands a thorough acquaintance with the details of operative surgery, and extensive general professional knowledge. Supplying soldiers with carbolized bandages cannot be classed among trustworthy antiseptic remedies. Measures like the above, or even still more complicated ones, must be introduced into obstetrics, for the fact of providing midwives or nurses with carbolic acid is by no means a guarantee of antiseptic treatment being carried out. Unfortunately, during labour the practical application of the rules of antiseptic surgery is not so easily attainable. To begin with, during the act of parturition, which is a physiological process, nature in most cases operates herself, producing a self-inflicted post-partum wound. The hæmorrhage resulting therefrom she also arrests by the contractions and elasticity of the womb, and partly by the contractility of the lacerated membranes of the genital passages. The accoucheur has in the majority of instances to assist the natural progress of labour, and only rarely to operate in a surgical sense (incisions of the neck of the womb, stitching a lacerated cervix uteri or perinæum). Drain-

[1] Bergmann, "Ueber Antiseptische Wundbehandlung," *St Petersburger Medicinische Wochenschrift,* 1882, No. 43, p. 368.

age tubes for removing the lochiæ after natural labour can only interfere with uterine contraction, and can even conduce towards the entrance of the germs of infection into the cavity of the womb. They are of use in those cases only where putrefactive changes have already commenced, as in the post-partum discharges of endometritis. The prophylactic drainage tube is condemned by most accoucheurs, while intrauterine injections are not only in disuse, but are even considered dangerous. Gusserow (*loc. cit.*), Hoffmeier,[1] Fischel,[2] Egli, Sinclaire, and before their time most of the members of the St Petersburg Obstetrical Society, urgently protested against intrauterine syringing, which Dr Radetsky diligently employed in one of our St Petersburg maternities.

For the same reason the resort to antiseptic plugging of the os, even with iodoformized tarlatan, as suggested by Dr Rein, is dangerous. Gusserow is a particularly strong opponent of this method, the more so as the plug, after having been some time in the uterine canal, becomes rather an excitant than a preventive of infection. The use of Lister's bandages is inapplicable in midwifery, and can easily be replaced by another, presently to be considered, method, which does not interfere with the post-partum discharges. The prophylactic measures in midwifery should be confined chiefly to the condition of the lying-in room, to pedantic cleanliness in the accoucheur and all the attendants, as well as surroundings, to careful nursing of the gravid as well as parturient woman, and lastly, to a strict use of disinfectants during and after labour.

The Lying-in Chamber.—In private practice it is necessary to select the airiest room, and one with plenty of light in it. To remove the presence of any existing germs, the carpets and furniture had best, before labour sets in, be well cleaned with a damp towel. In cases, however, where a suspicion exists of the presence of the germs of any specific poison, such as scarlatina or diphtheria, the chamber must be disinfected firstly by chlorine, and then, just before the removal of the patient, a spray of 5 per cent. of carbolic acid, or better, $\frac{1}{10}$ per cent. of corrosive sublimate, should be resorted to. In lying-in hospitals and in infirmaries it is absolutely necessary that labour should take place in a room set apart (and well aired) for each patient. It is difficult, nay, as a rule impossible, to trace the importation of infection during parturition, when several women are almost simultaneously delivered in one large

[1] Hoffmeier ("Uber den Werth Prophylaktischen Uterus Ausspülungen gleich nach der Geburt," *Zetschr. f. Geburtsh. und Gynæk.*, vol. v. p. 175) admits the utility of intrauterine injections only in tympanitis of the uterus during labour; in healthy labour he considers them injurious.

[2] Fischel ("Zur Therapie der Puerpuralen Sepsis," *Archiv f. Gynæk.*, vol. xx. p. 1), after repeated resorts to intrauterine therapeutics in Prague, found the mortality after childbirth rise from 0·4 to 1 per cent. After abandoning intrauterine injections the mortality at once fell to 0·2 per cent.

ward. Separate lying-in rooms have this advantage over general wards, moreover, that the appearance of, for example, endometritis in partu in but a single patient would necessitate the closing of a whole ward in one instance, and would thus deprive many women of the use of the maternity, while in the other case the temporary loss would be confined to a single room. On the appearance of post-partum infection, the room where labour took place should be disinfected either with chlorine—as one of the best of antiseptics—or by sulphurous acid (the burning of sulphur in the room) during at least from six to eight hours, or, when practicable, by the use of steam. The latter remedy is as yet inapplicable to most of our maternities. The floors should be washed with a 10 per cent. solution of carbolic acid, or, what is better and cheaper, $\frac{1}{10}$ per cent. of corrosive sublimate. Only after long continued airing of the room, subsequent to the above measures, can a new patient be admitted within its walls. Operations, when many onlookers are present, should be performed in a large ward, where carbolic acid or corrosive sublimate spray has been largely used as a preliminary measure. The attendants, as well as all articles of the lying-in chamber, should not be brought in contact with patients already delivered; sick parturient women should be kept in a different part of the building from the healthy; the rooms for those awaiting their confinement should be as large and light as for those already in labour.[1] The patient should not be left in the lying-in ward longer than two hours after delivery—only as long, in fact, as is required for watching the contractions of the uterus.

The physicians and all attendants should be fully impressed with the importance of antiseptic measures, and should, in their persons, be scrupulously cleanly. The accoucheur should have a special suit for visiting puerperal patients, and the best thing to wear on entering the lying-in ward is a linen apron over one's coat and trousers. It would be desirable to see the nurses dressed in some light material that can easily be washed, such as chintz, for example.

Particular attention should be paid to washing the hands in some antiseptic solution, and to carefully cleaning the nails with a brush, before every examination per vaginam. Chlorine water, a 5 per cent. solution of carbolic acid, and what is in special favour of late, $\frac{1}{10}$ per cent. of corrosive sublimate (Koch, Tarnier), are considered the best antiseptics. While midwives or nurses are in attendance upon a puerperal patient, they should be strictly prohibited from taking any new case; where, however, the demand is in excess of the supply they should be enjoined to disinfect their hands under the supervision of a physician.

[1] In the lying-in barrack of Rojdestvensky Hospital of St Petersburg, the rooms assigned to the post-partum women look to the south-east and have no dark blinds to the windows. I have observed no ill effects on the patients, whereas the gain from light was indisputable.

Nurses and midwives should have the fact impressed on them that it is not only the discharges of puerperal patients that are dangerous, but that their hands may become media of infection after contact with any decomposing animal matters, such as handling beef in the kitchen, dressing cancerous sores, touching menstrual blood, etc.

The question has also been raised as to when accoucheurs, students, and midwives are justified in resuming midwifery practice after handling corpses, pathological specimens, or any decomposing animal matters? Some authorities, Winkel,[1] for example, impose abstinence from midwifery practice from two to four weeks after infecting organisms have been touched; Zweifel,[2] and in Russia Dobronravof (*l. c.*), during eight days; Spiegelberg allows of a shorter time; Schröeder two days; Rein does not limit the period. Others, again, like Ahlfeld[3] and Lohlein,[4] do not consider even a single day necessary, but insist upon resorting to strong antiseptic measures after contact with infectious cases, and immediately prior to the examination of the parturient woman. Volkmann, the surgeon, goes so far as to assert that by employing antiseptic measures he has been able, without danger to his patients, to operate almost directly after working in the dissecting-room.[5]

At the Berlin Obstetrical Society, the question of abstaining from midwifery practice was decided in the negative; even Schröeder gave way to the opinion of the majority, with the proviso, however, that besides disinfecting the hands and changing clothes, he considers the use of a bath necessary before attendance on the lying-in woman.

As a matter of fact, one cannot help agreeing with Lohlein that *septic germs are not killed by time but by strict disinfection.* After contact with contagious cases, a threefold washing of the hands with an antiseptic fluid (viz., immediately after the examination, on returning home, and prior to a new exploration), a change of dress, and avoidance of gloves, are absolutely necessary.

It is also imperative for some time before undertaking a midwifery case to abstain from attendance in the dissecting-room, or on patients with infectious diseases.

The instruments and utensils used in obstetric practice must be disinfected, however clean they may look. Their disinfection is easily carried out by either immersing them in boiling water for a quar-

[1] Winkel, *Berichte und Studien*, vol. iii. pp. 439, 440.

[2] Zweifel, "Die Prophylaxis des Puerpural-fiebers," *Berliner Klin. Wochenschrift*, 1883, pp. 4–6. Swiecicki, *Centralblatt für Gynækol.*, 1883, No. 16, p. 242.

[3] Ahlfeld, *Centralblatt f. Gynæk.*, 1880, No. 11, p. 374.

[4] Hermann Lohlein, *Centralblatt für Gynækol.*, 1883, No. 23. Fritsch in the same Journal.

[5] Wiedow ("Zur Frage der Antisepsis während der Geburt," *Centralb. f. Gynækol.*, 1883, No. 37) justly observes that it is not every one who would allow such a surgeon to operate on him.

ter of an hour, and then washing them (if steel instruments), in a 10 per cent. solution of carbolic acid, and if of guttapercha or clay, in a 0·1 per cent. solution of corrosive sublimate. Syringes should be replaced by Esmarch's cups (the best are glass cones) with straight glass nozzles. These are both cheap and clean. Sponges should be banished, and their place supplied by hygroscopic or salicylicized wadding; in the absence of these, by scrupulously clean towels or rags. The waterproof sheet should be new if possible; while in maternities, where frequent change would prove too expensive, it should be well washed each time after use with a 0·2 per cent. solution of corrosive sublimate, or with chlorine water, and then aired for twenty-four hours. Linen laid aside for ordinary (healthy), should not be used for pathological, labour. A disinfecting stove should be arranged in connexion with every maternity, while two wash-houses are always needed—one for the linen of the healthy, the other for that of the diseased lying-in women. The patient's bed should be kept scrupulously clean, and any soiled linen lying under it should be removed. In maternities and among the poor, only straw mattresses should be used, while a change of straw and a freshly-washed linen mattress covering should be provided for every case. The straw may afterwards be employed in the stable.

The accoucheur's armaments should, if possible, be of metal, and nickelled, not guttapercha coated (Leytor's forceps, for example), as they are then more easily disinfected (unfertilized, as pathologists say) by different antiseptics, before and after use. The best way of disinfecting them is by immersion for quarter of an hour in boiling water, and then washing in a 10 per cent. solution of carbolic acid. Corrosive sublimate is not applicable in these cases, as it coats the metal. When metallic instruments are used, however, in cases of fœtid discharge from the uterus (endometritis during parturition, for example), they should be heated to a very high temperature by the accoucheur himself, or given to a surgical instrument maker for that purpose. All instruments had better be kept exposed in cupboards and not in velvet-lined cases; while for transport nothing can surpass a clean leather bag. Wrapping the instruments, unless nickel-plated, in carbolized muslin, which itself easily undergoes decomposition, attains no object except the production of rust. It is strange that such a procedure should have been recommended by Dr Rein.

In order to attain the minimum of danger of wounding the parturient woman, it is necessary that the accoucheur, besides being experienced, should as much as possible limit the number of internal, and resort more frequently to external examinations. This latter point I have strongly insisted upon and demonstrated in my course of lectures on midwifery during the last eight years. It has been carried out with good results at the Maternity Barrack

of the Ladies' Lazaretto Committee of St Petersburg, and is also strongly recommended by Prof. Rein.[1]

The arrest of hæmorrhage during and after labour is best attained by proper management of all the stages of parturition, particularly post-partum. According to the latest observations[2] recorded in medical literature, and according to my personal experience, the best is the expectant method of treating the placenta, *i.e.*, we should not remove it immediately after the birth of the child, but wait from one to two hours. This is the surest way to avoid tearing the membranes, while hæmorrhage under such treatment is of rare occurrence, during as well as after removal of the placenta. Expectant treatment should be active, if I might so express myself, but not in the direction of aimless explorations of the uterus; it should be active in regard to an examination every five minutes of the quantity of blood escaping from the vagina, and in regard to watching the expulsion of the umbilical cord, which will obviate the necessity of introducing the hand for ascertaining the position of the placenta. Moreover, the state of the bladder should be attended to, and care taken to have it emptied before the afterbirth comes away. Any lacerations at the vaginal orifice should also be seen to, in order that bleeding therefrom may at once be dealt with.

According to Ahlfeld's observations, when the expectant method is resorted to in dealing with the placenta, hæmorrhages occur more frequently from the os and neck of the womb than from the latter being in an atonic state. While watching the uterus before the expulsion of the placenta, only the fundus, if atonic, should be gently rubbed. No attempts should be made to drag the placenta out, until sure that it is in the vagina (the patient then experiences a *bearing down* sensation). All lacerations of the perinæum, the labia, and beneath the clitoris, should, if they are the cause of hæmorrhage, be stitched. Some abrasions of the vagina and the neck of the uterus can easily be united by *serre fines* (for the cervix there are *parte-serre fines*). Intravaginal and uterine injections (cold or hot) should in cases of atony of the womb be applied when labour is over (but not while there is hæmorrhage at the orifice of the vagina or from the neck of the womb) and imperatively with disinfectants, but not the preparations of iron.

In cases of atonic uterus, ergot of rye should be administered internally, and ice applied to the abdomen. In slight cases

[1] Frequent external examination places within one's reach the possibility of rectifying the position of the fœtus if abnormal, and very often removes the necessity of internal version, or greatly aids in accomplishing it, particularly in cases of placenta prævia. (This question has been fully ventilated in the St Petersburg Medical Society after a paper read on the subject by Dr Isain.)

[2] Dorn, "Zur Behandlung des Nachgeburtsheit," *Medicin Wochenschr.*, 1880, No. 41; Crede, *Archiv f. Gynækol.*, vol. xvii. p. 260; H. Abeg, *ibidem*, p. 372; D. Wilson, "The Proper Time to Remove the Placenta, etc.," *American Journal of Obstetrics*, 1882, p. 819; Ahlfeld, *Berichte und Arbeiten aus der Klinik. zu Giessen*, 1883, p. 117.

kneading of the uterus is sufficient. The separation of the membranes, when torn, had best be left to nature,[1] rather than risk the introduction of the hand into the uterine cavity. The latter procedure will be necessary, however, if any portion of the placenta is left behind. When labour is over, the retrogressive changes in the womb should be watched, but there should be no resort to digital exploration until from the eighth to the tenth day; in maternities, just before the patient's departure; and in private practice, the day before she gets out of bed. The binder should be placed on the abdomen only after the uterine contraction has been watched during at least two hours. Pressure on the lower part of the abdomen is best effected by small clean cushions (kept ready for use), and filled with sand that has been subjected to high heat, and then washed with a 1 per cent. solution of corrosive sublimate.

To ensure the free escape of the lochia in natural labour no drainage tube should be introduced into the womb, and the accoucheur should confine himself to watching the uterine contractions; a temporary resort, on the second or third day, to massage, and the gradual raising of the body (by placing one and then two pillows under the patient's back), are very desirable. The half-sitting posture, if hæmorrhage has not been excessive, as recommended by Paterson,[2] is also well worthy of trial. Exploring the uterus, particularly of primiparæ, on the second or third day after labour, may lead to the inoculation of the patient by decomposing secretions at the orifice of the vagina, to lacerations at the neck of the uterus, etc., etc.

Disinfection of the lying-in woman should be resorted to from the very commencement of labour, and during the whole of its continuance, in case of its becoming tedious. Just before labour begins a warm bath will be of service, and it will also be necessary to disinfect the outer genital organs and vagina. Thus the labiæ, pubis, and perinæum are washed with an antiseptic fluid, which is also injected into the vagina. The injection is repeated after tedious labour. Antiseptic tampons have been recommended, but they are more likely to prove harmful by acting as irritants, and are, perhaps, even themselves the cause of infection in some instances. They are much more safely replaced by a sprinkling of iodoform. According to the latest experiments of Tarnier and Koch, and the observations of Schede and Fritsch, the best of antiseptics is a solution of corrosive sublimate of a strength of 0·1 per cent. for external use, and a 0·05 per cent. for injections (a 0·1 per cent. solution causes a burning sensation in the vagina).[3] Carbolic

[1] Toporski, "Das Sublimat als Desinficiens in der Geburtshülfe," *Centralblatt für Gynækol.*, 1883, No. 35.

[2] Paterson, *Centralb. f. Gynækol.*, 1883, No. 12, p. 196.

[3] Rob. Koch, "Ueber Desinfection," *Mittheilungen aus dem Kaiserliche Gesundheitsamte*, Berlin, 1881, p. 234; Olivier, "De l'emploi de sublimé corrosif en solution pendant l'accouchement," *Annales de Gynecolog.*, xvii., 1882, p. 338; Kümmel (Koch, Schede), *Verhandlungen der deutschen Gesellschaft fur Chirurgie*, Berlin, 1882, xi. Congress, p. 276; Toporski, *loc. cit.*

acid of a strength from 2 to 5 per cent., as formerly employed, appears, according to Koch's researches, to be too weak; only a solution of 10 per cent. destroys germs, but then it also acts as an escharotic and irritant. Carbolic acid is expensive, moreover.[1] In Breisky's clinique chlorine water was used with success;[2] but this is also a comparatively expensive preparation, while its action on the respiratory track is very irritating.

Symptoms of mercurial poisoning after the use of corrosive sublimate have been observed very rarely (two cases in seven months) after surgical operations (Schede), and even in these instances the physiological action was confined to slight salivation and diarrhœa. Its certainty of action and cheapness speak highly in its favour, however. This preparation of mercury, moreover, does not produce that sensation of numbness in the operator's fingers which follows the employment of a strong solution of carbolic acid. There is only a slight roughness of the skin, while eczema has never been observed.

The hands, before making an examination, had best be anointed by glycerine or vaseline holding carbolic acid in solution (gr. xv. in a ℥j.); carbolic oil is not so good. In the absence of these, clean soap should be employed, the hands having previously been dipped in a ¹/₂₀ per cent. solution of corrosive sublimate. After the completion of labour, it will be necessary again to wash the outer generative organs and the vaginal outlet with a disinfectant fluid, —the best being a 0·1 per cent. solution of corrosive sublimate.

Injections into the vagina should be resorted to after those cases of labour only where the hand has been frequently introduced into the passage during an operation, or for arresting hæmorrhage. Intrauterine syringing is allowable only where decomposition of the fœtus has already taken place, or where there is endometritis during parturition (tympanitis of the uterus), as also where hæmorrhage is the result of an atonic state of the womb (the fluid used may be warm or cold, according to the requirements of the case). Solutions of iron must be avoided, however. Fissures and slight abrasions in general of the outer part of the vagina should at once, after the completion of labour, be dusted over with iodoform powder. The use of small cotton-wadding plugs (bourdouettes), as proposed by Dr Mann,[3] should never be resorted to. The use of these small plugs irritates the patient, stretches the vagina, and prevents healing by first intention; whereas simple dusting of the parts (gr. xx. at a time), as employed by myself

[1] Zweifel, *Zeitschrift f. Physiolog. Chemie*, vol. vi. The author has arrived at the conclusion that all disinfectants only arrest the development of spores, but do not kill them. His divergence of opinion from Koch's has not as yet been explained by any physiologist.

[2] Fischel, "Zur Therapie der puerpuralen Sepsis," *Archiv f. Gynækol.*, vol. xx. p. 1.

[3] Mann, "Iodoform in Wochenbett," *Centralb. f. Gynækol.*, 1882, p. 10; Bager, *ibidem*, p. 153.

during the last twelve months, rather soothes than annoys the lying-in woman, and rapidly heals the abrasions. When healing by first intention failed, clean-looking wounds were always produced; œdema of the labiæ was seldom observed, and inflammation still more rarely. The use of tampons of iodoformized tarlatan, as proposed by Professor Rein, or of peat plugs dusted with iodoform, as used by Ahlfeld of Giessen,[1] can only do harm, for the same reason that bourdouettes do. Even in non-obstetric cases, decomposition of the plug takes place within six hours, while post-partum the process is still more rapid. When dusting with iodoform was first resorted to, a high temperature after labour was less frequently observed, and in most cases it lessened the frequency of post-partum infection. The iodoform dusting had best be done with an ivory spoon or a piece of paper, several times daily, during the first week. I order the dusting to be repeated after each washing of the outward parts, and also subsequent to micturition and defæcation. A week after labour, iodoform need only be used twice or thrice daily. The only drawback to iodoform is its price. Attempts to substitute naphthaline for it have failed in my practice, as, after its use, the excoriations bled more and assumed a dirty appearance; in some instances œdema of the vulva ensued, and even colpitis. The objections to solutions of carbolic acid in glycerine or the glycerine of borax is, that they have to be introduced on cotton wadding, which irritates the patient, and, besides, does not act so well as a disinfectant; œdema of the labiæ and colpitis are also more frequently observed. Lying-in women who have experienced the application of cotton-wadding dipped in a solution of carbolic acid, and also of dusting with iodoform, speak strongly in favour of the latter. Any symptoms of poisoning from iodoform in obstetric practice, even after applying it very largely, I have not been able to observe.

The use of antiseptics in the shape of spray during labour, as practised in Basle and London (Barnes)—and the early reputation of which has already considerably fallen even among surgeons—has never established itself in obstetric practice, where it is resorted to only for preliminary disinfection of the lying-in chamber, or where operative interference is deemed necessary, or where a considerable number of pupils are present in one ward. Strict Listerism is not applicable in midwifery, in consequence of the mobility of the soft coverings of the pelvis, the continued discharge of the lochia, and the close proximity of the outlets of the bladder and rectum. The sprinkling of iodoform over the vaginal orifice replaces Lister's bandage to a certain extent; for, by covering the surrounding textures and fluids with a cloud of evaporating iodine, it protects them from contagion.

In cases of severe wounding of the orifice of the vagina during

[1] L. Ahlfeld, "Beiträge und Arbeiten aus der geburtsh," Klinik. zu Giessen, 1883, p. 230.

labour, covering the labia with a rag moistened with 0·1 per cent. solution of corrosive sublimate, or a 2 per cent. of carbolic acid,[1] has proved highly beneficial.

Besides the above-named agents, painting the excoriations with the tincture of iodine, as practised in Breisk's clinic in Prague, has given satisfactory results, although I have never seen it necessary where iodoform was employed.

The position the lying-in patient should be made to assume during the first few days after delivery is still unsettled. Some accoucheurs make the woman lie immovably on her back during three days; others go to the opposite extreme (Goodel in America and Solovief in Russia), and even counsel a sort of lying-in gymnastics—as, for example, getting up on the second day, making the bed by the patient herself, and exercise; while the observations of Garrigues[2] and myself are against early rising from the lying-in couch.

The turning of a lying-in patient from her back on to her belly, or suddenly to her side, will, by lessening intra-abdominal pressure, be the cause of what is called a *negative pressure* in the abdominal cavity, *i.e.*, the womb and vagina (of a patient lying on her side) are pulled deeply into the abdomen, and hence results increased absorption of the fluids that are collected and are decomposing within the uterine cavity. In this manner such a change of position may be the cause of her auto-infection. On the other hand, keeping the patient immovably on her back for three days, may produce stagnation of blood within the pelvis, and may also, by favouring the formation of plugs within the veins, interfere with retrogressive changes in the uterus; moving the body favours, as is well known, contractions of the uterus. Therefore to avoid lessening intra-abdominal pressure when the patient turns from her back to her side, the belly should have a binder wrapt round it; antiseptics should at the same time be used for disinfecting the discharges from the vagina.

For the above reasons, after having applied a binder (particularly if the upper part of the body has been raised), I consider it right to allow the patients to turn on their sides the second day after delivery. It greatly conduces to their comfort, and in no way interferes with the physiological post-partum changes.

From the fourth day the woman may safely be allowed to assume a semi-recumbent position. By the ninth day she should get out of bed, as keeping it a longer time not only weakens her, but may be the cause of irregular retrogressive uterine development (retroflexion), and may even favour increased loss of blood. Dr Solovief, of Moscow, observed the best results follow early

[1] Toporski, *loc. cit.*

[2] H. Garrigues, *The American Journal of Obstetrics*, 1880, p. 840; Solovief, "A quelle epoque convient il de faire lever les femmes apres l'accouchement," *Archives de Tocologie*, 1881, p. 93.

rising from the lying-in couch,—so far, at any rate, as retrogressive change in the uterus is concerned.

The proper nutrition of the lying-in woman has a by no means unimportant bearing on the prevention of disease, particularly among those who suckle their infants. Dr R. Barnes[1] regards appropriate feeding as part of those remedies which collectively constitute "antiseptic midwifery." (Most accoucheurs give healthy lying-in women beef-tea, milk in moderate quantities, and a small amount of bread; while to those who suckle they allow boiled fowl during the first few days after delivery, and roast-fowl, roast-beef, chicken, cutlets, and stewed apples after the fourth day, when the bowels have been moved.)

As I have heard the father of antiseptic surgery, Professor Lister, say, disinfectants cannot always prevent suppuration in a wound, but can only limit that suppuration, and render it more innocuous (non-infective). The same remarks apply, and even in a stronger degree, to obstetrics, where, as we have not the power to remove the self-inflicted wound of parturition, we fail, even with the strictest adherence to antiseptics, to prevent infection in all cases, and have thus to content ourselves with endeavouring to limit the ravages of the disease, and trying to give it a more favourable turn. This we are able to accomplish.[2]

In obstetrical clinics, and in schools for midwives, the diseases and death-rate among lying-in women are greater than in maternities where no pupils are admitted. Thus, in the luxuriously constructed new obstetrical clinic of Paris, so highly lauded by the late Prof. Horwitz,[3] the mortality during the first year was as high as 1·8 per cent.[4] With Hecker of Münich it was 1·6 per cent. Even with strict antiseptic measures used by Bischoff of Bâsle, the death-rate there was 1·6 per cent., while with Ahlfeld[5] of Giessen it was 1·09 per cent. (the general mortality being 1·49 per cent.) In the lying-in barrack under my care, the mortality from puerperal fever was 0·8 per cent. out of a general mortality of 1·4 per cent. (622 cases). Meanwhile, in Tarnier's maternity pavilion, whither no pupils are admitted, and where the patients are always attended to by the same experienced staff, the death-rate during the first years never exceeded 0·5 per cent.; latterly, among 608 deliveries, there was not a single death.

[1] R. Barnes, "L'obstetrique antiseptique et la septicémie en obstétrique," *Ann. de Gynekol.*, vol. xvii., 1882, p. 174; *American Journal of Obstetrics*, January 1882.

[2] From Zweifel's experiments on decomposing matters, it would appear, as I have already pointed out, that antiseptics only arrest the action of putrefactive micrococci, and impede their excessive development, but do not kill them.

[3] *An Obstetrician's Excursion to Paris*, 1881 (Russian).

[4] "Compte rendu de la nouvelle clinique d'accouchement," *Archives de Tocologie*, 1882.

[5] *Berichte und Arbeiten aus der Klinik zu Giessen*, F. Ahlfeld, 1883, p. 234.

In obstetric schools the parturient woman is examined by several pupils in succession, and thus slight wounds of the generative organs, very insignificant possibly, are inevitably produced. Every school, moreover, interferes to a considerable degree with enforced disinfection, particularly when non-resident pupils are admitted to the patient's bed-side. Inexperience in exploration has also an important bearing on the useless causation of wounds, besides increasing the possibility of infection.

With the view of preventing or lessening puerperal disease in obstetric schools, it is imperative that pupils, before being allowed to examine lying-in women, should be better versed in gynæcology than what they are as a rule, and that they should first be instructed in the digital examination of non-parturient patients. They ought also to be made to practise on the dummy pelvis, with a dead infant inside it, so as to accustom their hands to define the position of the fœtus. Only after having passed a practical examination in gynæcology, and on the dummy, should the pupil be admitted to the lying-in ward. Three years' practice of the above rules among young midwifery nurses have convinced me of their easy applicability and good results.

To carry out antiseptic measures to their fullest extent, it will be found necessary to have a special dress that could easily be washed, and kept in the institution itself. The nurses and accoucheurs should be provided with clean linen pinafores, while the disinfection of the pupil's hands had best be carried out under the personal superintendence of one of the assistants.

Students and midwives should carefully avoid the study of practical anatomy and pathology during attendance at the maternity. Should they have been in contact with dead bodies, or dressed sloughing wounds, they should frankly acknowledge it, and only return to the lying-in chamber after two days' absence, and after the employment of the strongest disinfectants. This is all the more necessary, as it is difficult for them to carry out the above rules of antiseptic midwifery which are within easier reach of the physician (the possession of several suits of clothes by the latter, for instance). Students and accoucheurs can keep pace with the extension of our knowledge regarding the struggle against contagious diseases, while midwives and nurses, on the other hand, are rarely able, after leaving school, to watch or study the progress of science. Moreover, our schools for midwives throughout Russia, and even in St Petersburg itself, have neither a proper programme nor course for study.[1]

[1] In Prussia new laws affecting midwives have just been passed. Of these I shall here quote some of the principal ones referring to disinfection (see § 5 "Allgemeiner Verfügung Betreffend das Hebammenwesen," in the *Beilage zur Deutschen Medicinal Zeitung*, 1883, No. 38). All midwives are under a district medical inspector; they are obliged, before being allowed to practise, and during the whole continuance of practice—1. Personally to present

In anticipation of our being some day in possession of a regular programme for schools for midwives in Russia, and that laws will also be passed affecting alike the whole body of our heterogeneously educated midwives, I shall here take the liberty of stating what rules I consider applicable to them, these rules being the outcome of what has been laid down in the preceding pages. Every midwife—and the rule applies to nurses who attend lying-in women as well—should comply with the following regulations:—

1. To put on a clean dress for every case of midwifery, the material being either chintz, or silk that washes well; and a clean linen or chintz pinafore, to be worn over a clean waterproof one.

2. To keep the hands (short-nailed) scrupulously clean, and to wash them, before and after each exploration, with a solution of corrosive sublimate (1 part to a 100 of water, or 16 grs.[1] to 24 oz., *i.e.*, four tumblerfuls of water), or in chlorine water; a 5 per cent. solution of carbolic acid is far inferior.[2]

3. The syringes employed for gravid women, or during or after labour, should be glass pointed, and should each time subsequent to use be washed with a 0·1 per cent. solution of corrosive sublimate, or a 10 per cent. solution of carbolic acid. After the glass point has been used in any lying-in case, it should either be heated to redness or destroyed.

4. If either the midwife or nurse is in attendance on a puerperal woman, particularly one with putrid discharges, or on a patient with either cancerous or non-malignant sores, she had better abstain from obstetric practice. Should circumstances, however, compel her attendance in the lying-in chamber, she must wash her hands and arms in a $\frac{1}{10}$ per cent. solution of corrosive sublimate, or a 5 per cent. solution of carbolic acid, or in chlorine water. This must be carried out three times in succession, viz.,

their diploma and indicate their place of abode, and to show their obstetrical armaments and a note-book for inscribing their cases. 2. To carry out the printed instructions for midwives, with any additions that may have been made thereto. 3. To have a journal for noting down all their cases. 4. To keep their obstetric armamentarium clean, to have the necessary antiseptics, and to possess the official manual. 5. To report to the inspector every case of puerperal fever or death from parturition. 6. Every three years the midwife is subjected to a test examination at the district inspector's. If the answers prove unsatisfactory, the examination is repeated every three months till she is found fit to re-engage in practice. These examinations are noted in her diary; the directors of the maternities and the teachers of the midwives take part in these test examinations.

[1] Midwives and nurses should be allowed the possession of a strong solution of corrosive sublimate (45 grs. to ℥ii. water). A teaspoonful of such a solution dissolved in a tumblerful of boiling water has $\frac{1}{10}$ per cent. of corrosive sublimate. The addition of an equal quantity of water to the above solution will make it fit for vaginal injection. To facilitate the solution of the corrosive sublimate, the addition of a small quantity of glycerine is necessary.

[2] Midwives not unfrequently put the carbolic acid in water without the addition of alcohol and glycerine, with the result that the acid very often floats about the liquid and cauterizes the generative organs of the patient.

immediately after examination of the contagious wound or discharge, on arriving home, and before attending the parturient woman. The dress should also be changed, and a bath taken if possible. The same threefold washing should be practised when the hands have come in contact with any dead animal matters, such as uncooked beef, the catamenial discharge, or the umbilical cord when in a state to drop off.

5. They should also avoid attendance on cases of diphtheria, scarlatina, erysipelas, and gangrene of the lung. Should there be a patient suffering from any of these diseases in the house occupied by the woman awaiting her confinement, the latter should be removed to another domicile if possible, or at any rate thoroughly isolated.

6. Every parturient woman should have her external generative organs washed with a 0·1 per cent. solution of corrosive sublimate, while injections into the vagina should be made with a $\frac{1}{10}$ per cent. solution, or a 3 per cent. one of carbolic acid and glycerine. In laborious labour, particularly when the temperature runs high, and the vaginal mucous membrane is dry, the injections should be resorted to during the whole course of parturition.

7. After the birth of the child, the external generative organs only should be washed; the placenta should not be squeezed out; while a piece of clean linen or hygroscopic wadding, saturated with a 0·1 per cent. solution of corrosive sublimate, or carbolic acid (5 per cent.), must be placed round the orifice of the vagina. Clean linen should be placed under the patient's buttocks, and examined every five minutes, to see whether hæmorrhage has taken place. If the bladder is full, the urine must be drawn off before the placenta comes away. To ascertain the position of the placenta, it is not necessary to introduce the hand into the vagina, but simply to watch and feel the umbilical cord. An hour, or, still better, two hours after the child is born, and when the patient has a bearing down pain, the belly should be gently rubbed, and after a couple of uterine contractions the womb should be pressed in the manner suggested by Créde.

8. In case of hæmorrhage, its origin should at once be ascertained, viz., whether it proceeds from lacerations of the vagina, or the neck of the uterus, or from the interior of the womb itself. If from abrasions of the vagina, then hygroscopic wadding, soaked in a solution of corrosive sublimate, should be applied to the wound, or the latter should at once be dusted over with iodoform powder, and the accoucheur at once sent for.

9. In case of rupture of the perinæum, or a lacerated or bleeding wound at the vaginal orifice, sutures must at once be applied. It should also be impressed on the midwife that there is more shame in trying to conceal these ruptures than in frankly avowing their presence.

10. After the placenta has come away, the external organs of

generation only should be washed with the antiseptic solution; while syringing the vagina should be confined to those cases where the hand has been introduced into the canal. All abrasions and ruptures at the vaginal orifice and of the vulva should be dusted with iodoform or naphthaline, and this should be repeated after each washing.

11. The patient should never be left sooner than two hours after the completion of labour. Uterine contraction must be watched, and the organ moderately kneaded (massage); after that the binder should be applied, and also a weight to the lower part of the abdomen,—(clean bags filled with sand, which had been previously heated, and then washed with a solution of corrosive sublimate, or clean folded sheets—not a dirty old book, whatever its literary merits—are best suited for the purpose.)

12. The bandages must be scrupulously clean; doubtful ones should be washed in chlorine water, or a solution of corrosive sublimate.

13. In dressing the patient twice daily, only the external generative organs and the orifice of the vagina should be washed; injections into the vaginal canal or the interior of the uterus should never be attempted unless ordered by the accoucheur, or where there is dangerous hæmorrhage. In the latter case antiseptic solutions only should be used.

14. The continued attendance of the midwife or nurse on the patient, particularly the first days after labour, is highly desirable. In any case she should be replaced by an able and trustworthy attendant.

15. The horizontal position of the lying-in woman should be gradually modified by placing pillows under the upper part of her body during the first four days, while after the fifth day she may be allowed to assume the half-sitting posture. She should not be allowed to leave her bed before the ninth day.

After I had written the above, an Article by Dr Braese, from Professor Schröeder's clinic in Berlin, appeared in the *Centralblatt für Gynekologie* for 1883, p. 617. The author refers to the application of a solution of corrosive sublimate in 330 cases, with a 3·3 per cent. of sickness, and a mortality of 0·6 per cent. Of the fatal cases there was contracted pelvis in one, where an unsuccessful, or rather uncalled for, attempt was made at turning, which resulted in paralysis of the uterus. The second case was one of forceps, applied to a primipara; the cause of infection could not be ascertained. In the other eight cases the ailment was slight, and the fever short. These results were attained in spite of a large number of operations (27 forceps, 19 turnings, 4 separations of placenta by hand, and 2 cases of placenta prævia, of which one was central).

Such highly favourable results were never attained before in any clinic. For washing and injection a 0·2 per cent. solution of corrosive sublimate was used. In a case of abortion at the fourth

month, the use of an intrauterine injection (of 0·2 per cent.) was followed by salivation, which soon passed away, however. The author agrees with Toporsky in considering corrosive sublimate the best disinfectant.

For the better illustration of the good effects which follow a strict application of the above rules in the treatment of lying-in women, I shall also here quote the comparative results obtained in obstetric practice before and after resorting to antiseptics. My observations were made in the same lying-in barrack, with the same staff of teachers and pupils.

I. From 1880 to 1883, with a less strict adherence to antiseptic rules than at present, the number of deliveries were 622. There were 226 cases of primiparæ, or 36·3 per cent., and nine cases of contracted pelvis, or 1·4 per cent. Operative interference was resorted to in ninety-eight instances, or 16·5 per cent. In eight of these the amnion had to be ruptured. The *expressio* of the fœtus (according to Kristeller's method), was applied three times, while there were fifteen extractions of breech presentations, or 2·4 per cent., and fifteen forceps cases, or 2·4 per cent. Podalic version, seven times, or 1·1 per cent. Perforation of the head and extraction by the cranioclast (Simpson's modified by Braun), six times, or 0·9 per cent. Separation of placenta, twice, or 0·3 per cent. Episistomia, or punctures of the vulva, ten times. Suture of ruptured perinæum, thirty-two times (failure of union in one case, or 3·1 per cent. of all the cases). Of these 622 cases, 102, or 16·4 per cent., were taken ill after childbirth, and nine, or 1·4 per cent., died. Of the nine, six succumbed to septic disease, thus producing a mortality of 0·8 per cent.

II. After resorting to a more strict application of antiseptic treatment, from the 26th September 1883 to the 29th April 1884, I had 233 cases of childbirth, of which six were twins, or 2·5 per cent., and seventy-five primiparæ, or 32·1 per cent. The number of contracted pelves was eight, or 3·4 per cent. There were fifty-three obstetric operations, or 22·7 per cent. Of these, four were rupturing the membranes; separation of the placenta, according to Créde, fourteen times; extraction by hand of four breech cases, and application of the forceps eleven times, or 4·7 per cent.; perforation of head and extraction by cranioclast, one case. Podalic version, three times, or 1·2 per cent. Suture of perinæum, thirteen times (all successful). Of these 233 patients nine, or 3·88 per cent., were taken ill after delivery, and six of these had puerperal fever, or 2·6 per cent. of the whole number of cases. Of the puerperal patients two suffered severely, one of them having entered the maternity after labour had been going on five days, and with a temp. of 104°. Both recovered. Not a single patient died. They all remained in the lying-in wards for as long a period as any of the preceding 622 cases, and not one was removed to another hospital. The more tedious cases were taken to the gynæcological barrack.

The officials and female pupils connected with the maternity remained the same. It will also be observed from the above cited figures that operative interference was more frequent, relatively, in the second period (*i.e.*, that of strict resort to antiseptics) than in the first, and that the number of twins, as well as contracted pelves, was also greater. But, for argument's sake, we shall even admit that the number of cases of irregular labour was equal during both periods. The naked figures tell their own tale. The percentage of sickness after childbirth was 16·4 per cent. for the first period, while it was only 2·6 per cent. for the second. The death-rate was 0·8 per cent. in the first, and 0 per cent. in the second. Of course a much larger number of cases are needed than I have been able to bring forward to settle the question beyond dispute, but even with those we have, one can pretty safely assert that a more strict application of antiseptics in midwifery has lessened the mortality of childbirth far more than the most hopeful amongst us ever dared to expect. A strict adherence to the same rules in my private practice—very limited, of course, in comparison with my experience at the maternity—has of late years shown a mortality of *nil*.

Such highly favourable results, in spite of the comparatively small number of cases that I can cite in support of my views, have induced me to write the present paper.

On the motion of the President, the Society thanked the author for his contribution.

MEETING III.—JANUARY 14, 1885.

DR ANGUS MACDONALD *in the Chair.*

I. *Dr Croom* showed a DECAPITATED FŒTUS, the subject of his communication.

II. *Dr Angus Macdonald* exhibited a DERMOID TUMOUR OF THE LEFT OVARY, removed from a girl of 21 years of age, on the forenoon of the meeting. The tumour was over three pounds in weight, was chiefly solid, composed of soft fibrous tissues, spaces filled with fat, and much osseous infiltration. Only at one or two points could hair be detected. The amount of bone contained in its structure, in the shape of isolated spicula, was so great that it was found nearly impossible to incise it with a knife. It contained one cyst cavity, from which was taken 12 ounces of a very dark, thick fluid, giving a dense deposit on heat and nitric acid, and presenting a density of 1038. The pedicle was short and thin, and had undergone two entire twists in the direction opposite to

that of the hands of a watch. As the omentum was adherent, with part of the tumour and the small intestine, to its posterior surface, it is clear the twist must have occurred at a period antecedent to the formation of these adhesions. The patient believes she always had the tumour, but of late it has given rise to such pain that she was compelled to seek professional advice. (The patient has made an uninterruptedly good recovery.)

III. NOTE OF A CASE OF DECAPITATION.

By J. Halliday Croom, M.D., F.R.C.P.E., Physician to the Royal Maternity Hospital; Assistant-Physician for Diseases of Women, Royal Infirmary; Lecturer on Midwifery and Diseases of Women, Edinburgh.

Version is generally one of the easiest of obstetric operations, and even in advanced shoulder cases so generally successful, that records of cases where all attempts to turn prove unavailing are comparatively rare. In fifteen years, including dispensary, hospital, private and consulting practice, until now I have not met with a case where I have found it impossible to turn; and the hospital books for many years back show no report of such cases.

I presume that cases where turning is impracticable must occur more frequently in country than in city practice, owing to the length of time labours are often allowed to go on in the hands of midwives, and the distance before skilled assistance can be got. In any case I have thought that the following report might not be uninteresting to the Society:—

Mrs J. S., a iv.-para, whose previous labours had all been forceps cases, went into labour on the morning of Thursday. She was attended by a midwife. The labour went, so the attendant said, on very slowly for some days, slight pains coming on at intervals. On Monday morning the membranes ruptured, when the pains became very strong and continuous. In the afternoon of the same day, as the labour was apparently not making any progress, she sent for the assistance of my friend Mr Grant. On his arrival he found the pains strong and almost continuous, the patient very weak and exhausted, and on vaginal examination found a hand presenting at the vulva. He did not attempt to turn, but sent for the aid of a neighbouring practitioner. After giving the patient a stimulant, and placing her deeply under chloroform, version was carefully attempted, and after prolonged efforts was abandoned as impossible. Before any further interference was undertaken, I was consulted in the matter. I saw the woman about 10 o'clock P.M. I found her exhausted; pulse about 130, small and weak. No fœtal heart sounds. She had come out of the chloroform. External palpation was difficult, the uterine ovoid being extremely hard; but the head was recognised lying in the left iliac fossa. Careful examination was made with regard to this condi-

tion of the cervix. The line of demarcation between cervix and body could not be felt. On vaginal examination the right hand, quite discoloured, was found protruding at the vulva. The position was therefore left cephalo-iliac, right acromio-anterior.

The right shoulder was well down and jammed in the brim, the axilla and ribs were easily recognised, and the head was reached high up and to the left. The uterus was firmly contracted round the fœtus.

Although the case certainly did not offer much inducement to attempt turning, yet from experience of former difficult cases, where the free administration of morphia and chloroform had so relaxed the uterus as to make the introduction of the hand possible, I resolved to give version a further trial. A $\frac{1}{4}$ of a grain of morphia was injected hypodermically, and shortly after patient was placed profoundly under chloroform. I perseveringly tried to introduce my hand to seize a foot. I found it impossible to get the tips of my fingers beyond the neck. The contraction of the uterus was so firm that I could scarcely move my finger in utero at all. After repeated efforts I desisted. In the meantime I had sent a note to my friend Dr Milne Murray, asking him to let me have the necessary instruments in case of failure. Unfortunately he misread my note, and brought only the ordinary instrument for craniotomy. As the condition of the patient would not admit of further delay, we at once proceeded to break up the fœtus. Two courses were open, either to perforate the chest and spine, or else to decapitate. As the neck was accessible and involved less cutting, and was more cleanly, the latter was selected. For want of any of the ordinary instruments for the purpose, I was obliged to use the ordinary perforator. While Dr Murray made steady traction on the arms so as to bring the neck to within as easy reach as possible, I introduced the perforator between the sixth and seventh cervical vertebræ, and after very considerable difficulty succeeded in cutting through the neck, the structures that offered the most resistance being the anterior ligaments.

Further traction was then made on the arm, and the trunk of the child was dragged through by means of the crotchet fixed in the medullary canal. The uterus remained firmly contracted on the head. Supra-pubic pressure was made to expel the head; but as this did not at once succeed, and as the woman's condition was extremely critical, to save further time and effort I put on the cephalotribe, crushed the head, and extracted it. The uterus remained firmly contracted over the placenta, which was expelled in a few minutes. There was no hæmorrhage. The uterus remained extremely hard. The uterine cavity and vagina were washed out with antiseptics. The patient remained weak and almost collapsed for some hours, but next morning she had recovered, and has since made an uninterrupted recovery. On examination

after delivery, the pelvis was found to have a conjugate of 3½ inches.

The case I have just related presents several points of interest, and some for criticism. In the first place, it is worth remarking the extreme rarity of such a complication in the practice of our Maternity Hospital, where for the last twenty years I have been unable to find the record of more than a single case,—a fact which goes to show that in the hands of medical students able to diagnose a presentation, assistance in such cases is early sought for, and version, therefore, seldom impracticable.

Wherein lay the difficulty in turning in the present case? Three factors were involved.

1st, The low impaction of the shoulder.

2nd, The narrow pelvis; and,

3rd, The firm tetanic contraction of the uterus.

Of the three factors the uterine contraction was by far the most serious difficulty. I could get with care and patience through the narrow brim and beyond the shoulder; but whenever my hand got within the uterus, the contraction excited, no doubt, dynamically, became stronger, and the onward advance of my hand was rendered impossible—the uterus became, as it were, moulded over every part of the child's body. On feeling the uterus externally with the free hand, one could trace the irregular outline of the uterus over the fœtal body.

I have believed and taught hitherto that morphia and chloroform combined overcame this tetanic contraction, and my experience till now in bad shoulder cases, even with the arm prolapsed, has justified me in so teaching. In the present case no effect was produced on the uterus by either of these drugs.

In such a case is it worth while trying to turn? I confess I scarcely think it is. The risks attendant upon version in such cases are much in excess of those accompanying embryotomy. Although my own experience in bad shoulder cases with the arm prolapsed, has hitherto been successful so far as version is concerned, yet in two of these cases the child was dead, and in the third the patient made a protracted recovery. It therefore seems to me that when the uterus is firmly moulded round the child, when the liquor amnii has long escaped, when the shoulder is engaged and the hand presenting at the vulva, in the interests of the mother the child ought to be sacrificed; for at full time spontaneous delivery is not to be expected. It must be kept in view that the diagnosis of the life of the child by means of the stethoscope is difficult, if not impossible, owing to the contraction of the uterus and the position of the child. My own opinion is, that often too much importance is attached to the delivery of a living child. In such cases as the present, where at the best the child's chances are extremely small, I should be inclined to advocate an early recourse to embryotomy. The

means at our disposal for accomplishing this end are practically three:—1st, Evisceration of the abdominal and thoracic cavities sufficient to allow version in the faulty portion, by bringing the pelvic extremity down, and thus imitating spontaneous version; 2nd, Spondylotomy, *i.e.*, complete division of the spinal column; and, 3rd, as in the present case, decapitation. When the neck can be reached, the operation seems to me the most satisfactory, being cleaner, quicker, and easier than any of the other two. The severance of the cervical column can be accomplished in several ways, either by Braune's hook, by the ecraseur, by the whipcord saw, or by scissors. Where Braune's decollator is at hand, it is no doubt an excellent instrument for the purpose. The record of many cases managed in this way seems to speak strongly in its favour. Judging by the present case, the use of the ecraseur or the whipcord saw would be impossible, owing to the insuperable difficulty of introducing the hand far enough into the uterus to allow of the chain or cord being thrown round the neck. A pair of scissors, or as in this case the perforator, seems to me more simple and equally effectual. The prolapsed arm aids greatly in drawing the neck within reach and fixing it while the operation is in progress, and also in extracting the body after the decapitation is completed.

Of course cases will occur where it is impossible to reach the neck, and in such circumstances one of the two former procedures becomes necessary; but the pelvis must be small, and the shoulder very completely jammed, where traction on the arm will not bring the neck within reach. With regard to the delivery of the after-coming head, much will depend on the condition of the patient. Supra-pubic pressure will in this, as in the after-coming head in breech cases, be usually sufficient. In cases, however, such as the one under consideration, quick delivery with as little pressure on the already tender uterus as possible will be indicated. The forceps, crotchet, or cephalotribe afford a ready means of accomplishing this—and of these the cephalotribe when at hand appears to me to be the most satisfactory.

Dr Carmichael had had no experience of such cases in private practice. While in Vienna he had seen three cases of decapitation in the hospital. These were all done by means of Braune's key-hook. This, from the efficient way in which it performed its work, seemed to him a ready and useful instrument. The hook being passed over the neck and firm downward traction made, two or three turns of the handle were sufficient to sever the spinal column. He was struck with the ease with which the head was extracted. Cases of this sort were rare, but he would certainly adopt decapitation in preference to evisceration or other form of embryotomy.

Dr Craig was happy to say that he had never met with any

case requiring decapitation in the course of his practice. As a student, he had seen two cases where the arm presented. The first was treated by Dr Andrew Inglis. In the other case, which occurred in the sister of the previous patient, bipolar version was performed by Dr Milne. Both patients did well.

Dr Milne Murray thought that Dr Croom had scarcely sufficiently emphasised the difficulties of the operation with the means which were at command. While the perforator was quite efficient in separating the bones of the spine, it was found that the separation of the ligaments was a matter of great difficulty, more especially that on the anterior surface of the vertebræ. The perforator could not be used on account of the risk of its slipping and wounding the mother's parts. Of course a pair of scissors with sufficiently long handles would have been invaluable, but they could not be had. With such an instrument the operation would be a simple one, and could offer no difficulty in such a case.

Dr Freeland Barbour had seen a maternity case some time since transversely jammed. The left arm was down, and fœtus was in left dorso-posterior position. The resident had tried to turn, and failed. Child was dead; no fœtal heart could be made out. The body of the child was soft and limp, and this enabled him to turn after some effort. With regard to the means for breaking up the child in cases of impaction, he had found that, in the tutorial class at least, the basilyst was an efficient apparatus, and was free from the risk of slipping to which Dr Murray had referred, as attending the use of the perforator.

Dr Angus Macdonald complimented Dr Croom on having brought forward a midwifery paper, a department in which the Society had been somewhat deficient of late. He had met with two cases of extreme difficulty on attempted turning. These were two cases of transverse presentations which defied turning. In one he performed evisceration, and delivered. It was, however, an objectionable and extremely dirty operation, and one which he would never again perform if he could avoid it. In the other case he performed spondylotomy, and has from its ease and efficiency a decided preference for the operation. Spondylotomy can be done best by means of a pair of long vaginal scissors. One blade should be sharp and the other probe pointed. It is a mistake to suppose that a very strong instrument is required. One cuts carefully through the skin, and then by means of the scissors divides an intervertebral disc. The principle of the operation is that we cut the bar represented by the axis of the fœtal body in such a way that the two cut ends over-ride, and so render the passage of the broken bar a matter of ease, although it was impossible to make the complete bar move inside the uterus. Dr Macdonald holds that spondylotomy is an easier operation than decapitation. It exposes no bones, and avoids risk of retention of the head. He recollected a case in which he was called to assist

another practitioner, who had in turning detached the body from the head, which was retained inside the uterus. The brim was narrow, and there was much difficulty in delivering it. It had ultimately to be seized and withdrawn by the cephalotribe. Decapitation in a narrow pelvis might give rise to similar difficulty, not to speak of the possibility of injuring the uterus with the cut end of the bones. Spondylotomy removed the possibility of such an accident. Considering the ease with which it could be performed, and the advantages it presented, he felt that this operation had not received that amount of attention which it deserved. It ought to be recommended as a safe and simple operation.

Dr Halliday Croom thanked the Society for its reception of his paper. He was interested to hear from Dr Carmichael that he had seen the decollator at work. He quite admitted that with a pair of proper scissors spondylotomy was a safe and simple operation.

IV. SPHYGMOGRAPHIC TRACINGS IN PUERPERAL ECLAMPSIA.

By J. W. Ballantyne, M.B., C.M., Buchanan Scholar.

In the three following cases of Bright's disease, complicating pregnancy, parturition, and the puerperium, I was enabled to make a series of sphygmographic tracings, and to gather from the consideration of these sphygmograms some indications as to the condition of the blood pressure and the pulse in this comparatively rare affection.

In the first case which came under observation during the pregnancy, prophylactic measures were adopted, and the parturition and puerperium were accomplished without the appearance of any eclamptic phenomena. In this case I obtained tracings during the pregnancy and puerperium.

In the second case, eclamptic seizures of a most serious kind supervened, and proved fatal to both mother and child in a remarkably short space of time. Here I was able to make sphygmographic observations during the course of the labour, and during the few hours which intervened between the birth of the child and the death of the mother.

In the third case, in which the labour also was rendered most dangerous from the appearance of eclampsia, but in which the result to the mother and child was most satisfactory, I was unable to take any tracings during the parturition, but obtained a complete series of observations during the puerperal period.

Putting the three cases together, I have, therefore, obtained tracings during all the three periods, namely, during pregnancy, parturition, and the puerperium; and in the hope that these

observations may prove of some value in elucidating certain vexed questions in connexion with puerperal eclampsia, I venture to bring them before this Society.

In making these tracings I used Dudgeon's pocket sphygmograph, which I have found to be the only instrument that one can with ease and safety make use of in the case of a woman in the second stage of labour. It is easy of application and manipulation, and the results obtained are quite trustworthy. It has one fault, and that is, that we are unable to use it for testing the pressure which is necessary to obliterate the pulse, since the highest pressure which we can bring to bear upon the artery is one of five ounces, and it would be therefore necessary, in order to complete these observations, to use a sphygmomanometer (such as that of Basch) in order to estimate the blood pressure. I was led to adopt Dudgeon's instrument chiefly from the good results which Lebedeff and Porochjakow obtained from its use in their observations upon the "Blood Pressure in Parturition and the Puerperium in relation to Pulse, Temperature, and Respiration," recorded in the *Centralblatt für Gynakologie* (No. 1, January 5th, 1884); and I feel convinced that I should not have been able to obtain the tracings which I show to-night with the more cumbrous instrument of Marey. Dudgeon's sphygmograph is so small that it can be carried in the pocket, it is cheap, and with it accurate observations can be made easily and almost as quickly as the pulse can be felt with the finger. With these few words of introduction I shall proceed to relate the cases above mentioned, and to consider the pulse tracings obtained during their progress.

On June 30th, 1884, a case of Bright's disease complicating pregnancy was admitted into the Buchanan Ward of the Royal Infirmary. The following are a few short notes of the case:—

Mrs R., 23 years of age, was eight months advanced in her second pregnancy. On the 28th of May she first noticed that her feet, legs, hands, and face were much swollen, and at that time also she suffered from pain in the loins, and observed that her urine was small in amount and dark in colour. She applied to a medical man, who gave her some medicines which increased the quantity of the urine and lightened the colour of it; but the swelling of the limbs and face still remaining, she came for advice to Professor Simpson, and was admitted to the Buchanan Ward as above noted. The urine, on being boiled, became almost solid, from the large amount of albumen present in it. On microscopic examination some epithelial tube casts were found. The quantity of urine passed in the twenty-four hours was small (about 15 oz.); it had a low specific gravity and a clearly acid reaction. The heart was slightly enlarged, and in the mitral area a soft double murmur was heard accompanying the first sound; there was also a reduplication of the second sound in the aortic, but more especially

in the pulmonary area. She was eight months pregnant, and the fœtal heart was most distinctly heard above the umbilicus on the right side. Bright's disease complicating pregnancy having been diagnosed, the patient was put upon an exclusively milk diet, and was given tincture of the perchloride of iron in 20 minim doses thrice daily. She was also kept at rest. Under this treatment the whole condition improved, and the amount of albumen gradually decreased. Seven days after admission the patient was confined of a small female child, without any sign of an eclamptic fit appearing. The puerperium also was perfectly normal, and the patient left the Infirmary eleven days after confinement, with scarcely a trace of albumen in the urine, and with an improved condition of the heart, *i.e.*, the murmurs had disappeared in the mitral area, and there was only slight accentuation of the second sound in the pulmonary area. The child lived for five days.

During the progress of this case I was only able to get three sphygmographic tracings taken, two before and one after the confinement. The two first tracings (*vide* Figs. 1 and 2) were made five days before parturition, and show very well the high tension pulse characteristic of Bright's disease. There is a well-marked tidal or predicrotic wave, and a slightly marked dicrotic. These features are brought out best with a pressure of 2 oz., as seen in Fig. 2. The high vascular tension at this time was probably due to two causes — (1), the difficulty of arterial outflow, arising from the condition of the kidneys; and (2), the hypertrophy of the heart due to the pregnancy and to the Bright's disease. In the third sphygmogram (Fig. 3), taken some twelve hours after delivery, there is seen the marked fall in vascular tension which is characteristic of normal parturitions it is true, but which is particularly characteristic of the pulse during the first few hours after a delivery which has been complicated by renal, cardiac, or pulmonary mischief. I was unable to get sphygmograms of this case taken continuously, therefore I do not place much faith in the conclusions drawn from them, and simply record this case as the only one of Bright's complicating labour in which I obtained any tracings at all during the pregnancy.

The second case of Bright's disease complicating pregnancy and labour was a much more serious one, for it terminated in an attack of eclampsia, which, with an advent as unexpected as that of a tropical thunderstorm, assailed the patient (to all appearances in a state of perfect health), and, running its course unchecked by most vigorous therapeutic measures, proved fatal to both mother and child within the short space of twenty-eight hours.

Case II.—M. S., a well-built, fine-looking girl of eighteen years of age, was seven months advanced in her first pregnancy, and was apparently in the enjoyment of good health. She was employed

in a printing-office, and on Saturday, October 25th, 1884, she tripped over a plank of wood in the office and bruised herself somewhat severely. About this date also she remarked to her father that her ankles were swollen at night when she took off her boots. On the afternoon of Sunday, November 2nd, as she was going upstairs to visit a friend, she said to a little girl who was with her, "My feet are away up at the top of that shed," pointing to a building some distance away. She, however, went upstairs without any assistance, but had not been in her friend's house many minutes when she took a violent fit. A medical man was sent for, who prescribed some medicine. She, however, continued having fits about once in every ten minutes, and on the doctor's return at 7 P.M. he saw her in one of these attacks, and fully realizing the gravity of the case, he called in Dr Hart, who on his arrival at 11 P.M. recommended her immediate removal to the Maternity Hospital.

The following was her condition on admission into the Hospital at about a quarter past one on Monday morning:—She was unconscious, the mouth was tightly closed, the face alternately flushed and pale, and the pupils widely and equally dilated.

She was at once put to bed, and the administration of chloroform, which had been with difficulty commenced in the cab during her conveyance to the Hospital, was continued. Before, however, the chloroform had time to act, she was seized with a very well-marked eclamptic fit. The eyelids began to twitch, the pupils contracted, the head was moved quickly from one side to another, and then the clonic spasms proceeded to affect the upper and lower limbs. The face became cyanosed, the breathing stertorous, and the pulse intermittent. Tetanic spasms appeared intercurrently with the clonic, and it was during one of these tetanic seizures that I obtained with considerable difficulty the first sphygmographic tracing (Fig. 4). This sphygmogram was taken just before she passed out of the fit into the state of sopor following it. This seizure took place about 1.40 A.M., and lasted fully five minutes. The inhalation of chloroform was continued, and as the teeth were being ground fiercely together, a cork was introduced to prevent her biting her tongue. On making a vaginal examination, the os uteri was found to be of the size of a sixpence, and the cervix thinned out and stretched over the fœtal head, which was low down in the pelvis and lying in the left occipito-anterior position. On auscultation over the abdomen the fœtal heart could not be heard; but so loud was her stertorous breathing that one could not be absolutely certain of this observation. The maternal heart-sounds also were inaudible from the same cause. The catheter was passed into the bladder and a few drops of urine obtained, which, on boiling, became almost solid from the presence of a large quantity of albumen. She was then given one minim of croton oil on a piece of loaf sugar, and two drachms of chloral hydrate.

She had also one-sixth of a grain of pilocarpin injected hypodermically. The administration of chloroform was continued, hot bottles wrapped in wet cloths were placed around her, and digitalis fomentations were applied to the loins. Attempts were made to dilate the os both digitally and by means of Barnes' bags, but with little success, the margins of the os being very firm, sharp, and rigid. We had, therefore, to content ourselves with the free application of unguents to the parts, and the use of vaginal douches. The temperature at this time, 2 A.M., was about 101°·4, the pulse 156, and the respirations 60 to 80 per minute. She had numerous incomplete fits while under the influence of the chloroform, the seizures coming on especially when any vaginal examination or other manipulation was made.

At 5.30 A.M. the os was found to be as large as a shilling. The skin was acting freely, and the bowels had moved several times. The chloroform was still continued, as any cessation in the administration of the anæsthetic caused a return of the eclamptic attacks. The temperature at this time was 101°·8, pulse 120, and respirations 70 per minute.

At 8 A.M. the os was felt to be dilating slowly, and at 9 A.M. it was fully dilated. The membranes had ruptured, and the waters escaped before patient was admitted to the Hospital. The temperature was now 101°·4, and the respirations 43 per minute. A large quantity of frothy mucus and saliva was dribbling from the mouth, and the breathing was still loud and stertorous. About 5 ounces of urine were drawn off by means of the catheter. On boiling, the urine was found to contain at least 50 per cent. albumen, to be acid in reaction, and to have a specific gravity of 1020.

Professor Simpson and Dr Hart saw the patient at ten o'clock, and as the head was now on the perineum, the former was of opinion that the labour would be completed by the natural efforts, and that forceps would be unnecessary. The head was born at 11.10 A.M. and the body five minutes later, the uterus being assisted to contract by supra-pubic pressure. Twenty minims of ether and 15 minims of ergotin were injected hypodermically. The child was still-born, and although efforts were made to resuscitate it by Schultze's method, these proved of no avail.

The placenta was delivered by Credé's method at 11.45 A.M. The vagina was washed out with the corrosive sublimate solution, and hot milk and digitalis were given by the mouth. Temperature was now 102°, and pulse 104. Patient was lying in a comatose state, with face and lips in a very livid condition, and the breathing was loud and stertorous. Chloroform was discontinued immediately after the birth of the child, and no fits occurred from that time till her death.

The rest of the history of the case may be summarized as an unsuccessful attempt to save the patient by means of stimulants, for she gradually sank and died at 9.25 P.M., ten hours after delivery, and twenty-eight after the first eclamptic seizure.

1 P.M.—15 min. ether hypodermically, and hot milk; temp. 101°·6.

3 P.M.—10 min. ether. Poultices applied to chest, as there were marked signs of pulmonary œdema.

3.30 P.M.—1-90th gr. sulphate of atropia injected. Temp. 102°, pulse 140, thready and dicrotic.

4 P.M.—Discharge from mouth and nose less marked.

4.20 P.M.—She opened her eyes for a few minutes, but did not speak.

5 P.M.—Still copious watery discharge from mouth and nose. Poultices to chest continued.

5.30 P.M.—1-90th gr. sulphate of atropia given hypodermically.

6.15 P.M.—15 min. of digitalis by mouth.

7.30 P.M.—15 min. of ether hypodermically.

9.25 P.M.—Died, never having regained consciousness.

The post-mortem examination was made thirty-six hours after death by Dr Byrom Bramwell, and the following were the appearances seen :—The pericardial sac contained ½ oz. of clear serum. The cavity of the left ventricle was normal, but the wall was hypertrophied (⅝ in.) The right heart was healthy. Cone diameters of mitral 1·4, aorta ·9, tricuspid 1·65, pulmonary artery 1·1. The heart weighed 10 oz. The left pleural cavity contained 2½ oz. of clear serum, and the right 2 oz. The left lung weighed 1 lb. 4½ oz., and was heavy for its size. There was solid œdema and some congestion of the lower lobe, and a less degree of œdema of the upper lobe. The right lung weighed 1 lb. 7½ oz., and presented very much the same appearance as the left lung, but was not quite so solid. There were traces of old inflammatory disease at the apex, and some of the bronchi were diseased. The liver weighed 3 lbs. 12 oz., was slightly fatty, but otherwise normal. The spleen weighed 3½ oz., and seemed normal in appearance. The left kidney weighed 5½ oz.; the capsule stripped off easily, and on section the cortex was seen to be very pale, whilst the pyramids were congested. The whole organ was tough and distinctly diseased, as far as could be made out with the naked eye. The right kidney presented similar appearances. The uterus was large in size, reaching to a point half-way between the symphysis pubis and the umbilicus. There were no signs of sepsis or peritonitis in the abdomen. On removing the skull-cap the brain convolutions were seen to be somewhat flattened out, but not otherwise abnormal. The superior longitudinal and all the sinuses within the cranium contained pale gelatinous clots. The brain weighed 2 lbs. 14 oz., and on section was seen to be œdematous, and felt softer than normal; the lateral ventricles were slightly enlarged, and the gray substance paler than usual. The cerebellum was also soft and œdematous. The retinæ and optic discs were normal. The sympathetics of the abdomen and neck were removed by Dr Bramwell for microscopic examination.

We may now consider the tracings obtained during the progress of this case. Of these sphygmograms, fifteen were taken during the first stage of the labour, three during the second stage, and four were obtained nine hours after the completion of the third stage. Those taken during the first stage are most remarkable in many ways, and must be considered in detail.

Fig. 4 represents a tracing taken during one of the tetanic spasms of the only well-marked and complete eclamptic seizure which the patient had after her admission into the Hospital. It shows an irregular, small, and rapid pulse, possessing nevertheless high arterial tension, as shown by the blunting of the apices and the merging with them of the tidal wavelets. The aortic notch is absent altogether in most of the curves, and only slightly marked in the remainder. Undoubtedly some of the peculiarities of this tracing are due to twitchings of the muscles of the forearm; still many of the curves are uninfluenced by these twitchings, and show clearly enough that we have to do with an artery containing a small quantity of blood, but blood in a state of high tension. Towards the end of the tracing, also, it can be seen that this state of high tension is passing off, and the pulse becoming almost dicrotic. This sphygmogram, perhaps, resembles most of all the tracing obtained during the rigor of fevers, or that seen in peritonitis.

The next pulse-tracing (Fig. 5) was taken shortly after the preceding, and immediately after the cessation of the muscular jerkings and twitchings. It also has the characters of a small pulse of high tension; but it has become somewhat slower and almost quite regular. The respiratory base line also shows no rise and fall. The high arterial tension in these two tracings may be very well demonstrated by Mahomed's useful method.

Tracing No. 6 was taken a few minutes later, and shows a marked change of conditions. The pulse is now somewhat larger, its rapidity is much diminished, and neither the tidal nor the dicrotic wavelet is very pronounced. It will also be noticed that every fourth beat is longer than the three preceding it, every third beat than the second, etc., and that the respiratory base-line now exhibits a slight rise and fall. The apex has regained its pointed character, and the tension, although still high, is distinctly less than in tracings 4 and 5.

Tracing No. 7 was taken about half an hour later during a slight fit, probably synchronous with a uterine contraction. The pulse curve has again considerably changed its character. It is still a small pulse, but it has now lost its high arterial tension, as evidenced by the appearance of a well-marked dicrotic wavelet following a sudden fall from the apex. It is much more rapid, and is distinctly irregular, some of the curves being fully, and others partly dicrotic—that is to say, in some the tracing falls to the respiratory base-line, and rises again in the dicrotic

wavelet, whilst in others it does not quite reach the base-line before the supervention of the second wave. It must be remarked that the fit in this case was a very slight one indeed, the patient being at the time fully under the influence of chloroform.

Tracing No. 8 was taken one and a half hours later, and shows that the fall in tension noticed in No. 7 is continuing. The tracing shows beautifully the full dicrotic pulse occasionally becoming hyperdicrotic in character, and resembling very much that seen in advanced stages of pernicious anæmia. The fall of the base-line with inspiration, and its rise with expiration, is quite easily made out. Nos. 9, 10, and 11 show tracings with the same characters.

No. 12 is a most remarkable tracing, and was taken two hours later, when the first stage was approaching its completion, and the patient was in a state of great exhaustion. The pulse is extremely rapid, reaching 198 beats per minute: nearly every beat is distinctly hypertrophic, showing a state of great depression of the vascular system seen sometimes after hæmorrhage in typhoid fever and a few other rare conditions. The aortic notch is now below the base-line, and the predicrotic wavelet is very feebly marked. The respiratory curve is very well seen, there being a fall with inspiration at every fourth beat, as a rule.

No. 13 was taken one minute after No. 12, and No. 14 one minute later. They both show a tracing with the same characteristics as No. 12, with the exception that the pulse is somewhat slower, and the respiratory curve even better seen. Some of the curves are fully dicrotic, others hyperdicrotic. The temperature at the time that these tracings were taken was 101°·8, and the respirations 40 per minute. No. 15 shows effect of a small pressure (2 oz.)

We now pass on to consider the tracings obtained during the second stage of labour, which were three in number. They were taken at 9.40, 9.42, and 9.43 A.M. respectively, before, during, and immediately after a uterine contraction; they therefore show very clearly the effect of a pain upon the pulse curve in this case. Of these Nos. 16 and 18, taken before and after the pain, are almost identical. They show a fully dicrotic, occasionally hyperdicrotic, sphygmographic tracing with a respiratory curve almost as well seen as in the tracings obtained in cases of spasmodic asthma. She was breathing very stertorously at this time. The predicrotic wavelet is very feebly marked. The aortic notch is either on or below the base-line, and scarcely any part of the tracing lies above the line joining the apex and the aortic notch. In No. 17, the effect of a uterine contraction upon the pulse curve at this stage of the illness is well brought out. There is a slight increase of the arterial tension, as shown by the slightly more marked predicrotic wavelet blended with the apex. The dicrotic wavelet is not so

clearly marked as before and after the pain. All the preceding tracings, with the exception of No. 4, were taken while the patient was under the influence of chloroform, and the later ones were in addition complicated by the fact that various medicines had been administered. The anæsthetic was discontinued immediately after the completion of the labour, and four sphygmographic tracings were taken nine hours later—that is to say, one hour before death. As these tracings are almost identical, we shall describe one only, namely, No. 20. In this sphygmogram we have an example of a monocrotic tracing which is produced by the quickening of a hyperdicrotic tracing to such an extent that the second beat is lost altogether. It is, of course, characteristic of an extremely low tension. It will be noted that the pulse was now regularly irregular, every fourth beat being much smaller than the three preceding. The ascent and descent of the respiratory base-line are well seen. It must be remembered that this condition of the pulse supervened notwithstanding the administration, at frequent intervals, of various stimulants, chiefly digitalis, brandy, and ether.

The patient gradually became altogether pulseless, and died one hour after the taking of the last mentioned sphygmogram. I shall summarize the information derived from these tracings at the end of this paper after I have narrated the third case of Bright's disease complicating pregnancy, parturition, and the puerperium, in which I was enabled to make sphygmographic observations.

At 10 P.M. on January 4th (ten days ago), I was summoned by Mr Macbeth Moir, one of the Maternity pupils, to an extern patient who was, he said, in strong convulsions. On our way to the case he acquainted me with the following particulars:—

The patient, Mrs W., a primipara of 24 years of age, was seized with slight labour pains during the forenoon of January 4th. The membranes broke and the waters came away in the early morning, and in the afternoon the pains became more severe, so she applied at the Hospital, and Messrs Morgan and Moir were sent to the case. During the few days preceding labour she had suffered from nausea and headache, but had had no visual disturbances. She had noticed during her pregnancy that her legs were considerably swollen, especially near the ankles, and that her urine was small in amount and dark in colour. A vaginal examination made at 4 P.M. disclosed the following facts:—The head was presenting in the right occipito-anterior position, the os uteri was about the size of a shilling, and the anterior lip of the cervix thick and œdematous; the pains were strong, and were acting efficiently in dilating the os. Labour proceeded slowly; at eight o'clock the os was as large as a half-crown piece, and at 9.30 patient desired to micturate, and while doing so was suddenly seized with violent convulsive fits. Her face became cyanosed, there were twitching movements of the facial muscles, the head was jerked from side to

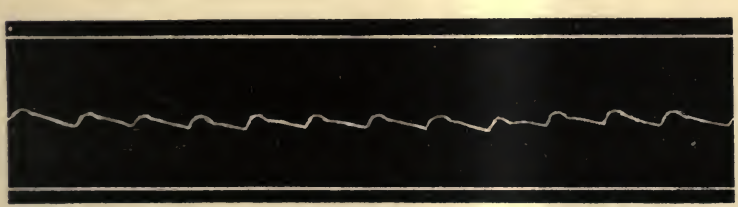
1.

Mrs. R.—Bright's disease in pregnancy. Pulse of high arterial tension. (2½ oz.)

2.

Mrs. R.—The same pulse under a slightly lower pressure. High tension character well seen. (2 oz.)

3.



Mrs. R.—Tracing obtained twelve hours after delivery. A smaller, quicker pulse of decreased tension. (1½ oz.)

4.

M. S.—Eclampsia complicating labour. First stage. Eclamptic fit passing into state of sopor; shows small pulse of high arterial tension—some irregularities, due to muscular twitchings. (3 oz.)

5.

M. S.—Tracing taken in interval between fits, during administration of chloroform, high tension continuing. (2 oz.)

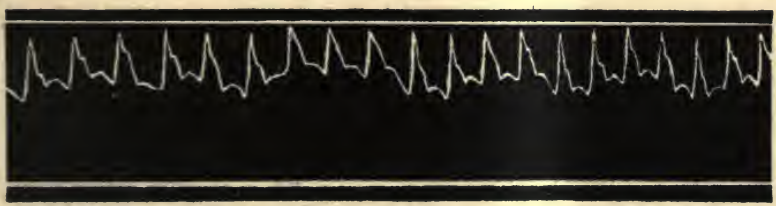
6.

M. S.—Tracing taken a little later than No. 5, pulse slower and larger, condition of patient similar. (3 oz.)

7.

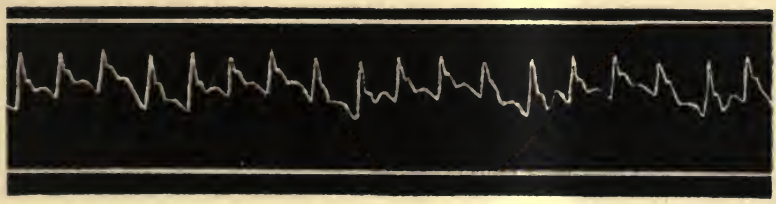
M. S.—Tracing taken during a slight fit. A quick pulse with diminished arterial tension, dicrotic wave becoming marked; slightly irregular. (2 oz.)

8.



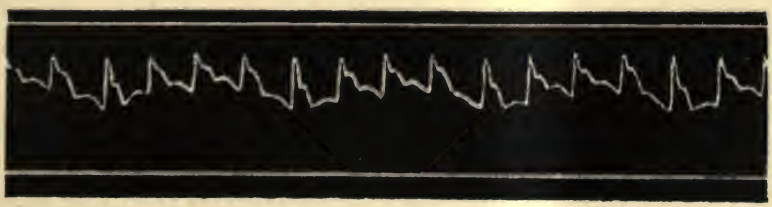
M. S.—In first stage of labour. Pulse becoming more dicrotic, tension low, slight irregularity in base line; under chloroform. (4 oz.)

9.



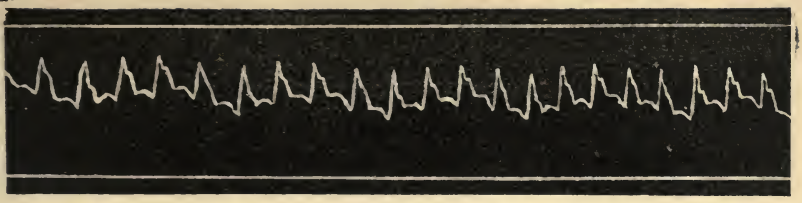
M. S.—Same as No. 8, but more fully dicrotic. (4½ oz.)

10.



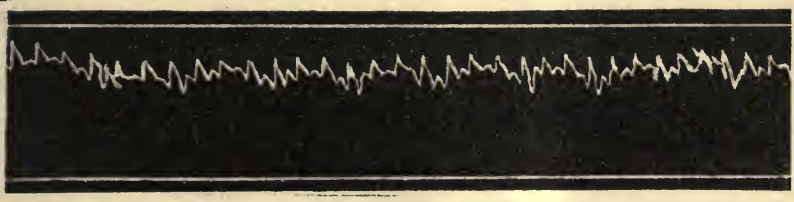
M. S.—Similar to Nos. 8 and 9. (4½ oz.)

11.



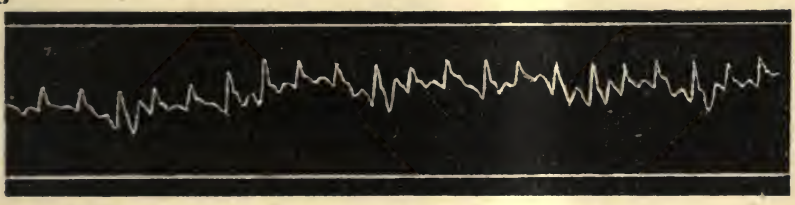
M. S.—Similar to Nos. 8, 9, and 10. Hyperdicrotic occasionally. (5 oz.)

12.



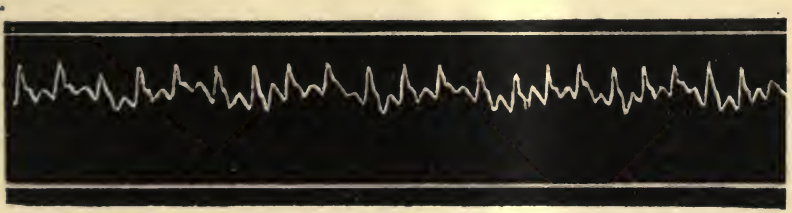
M. S.—First stage approaching completion, very rapid, small and hyperdicrotic pulse, rate 198 per minute. Deeply under chloroform, respiratory curve seen, pressure necessary to bring out characters is high. (4 oz.)

13.



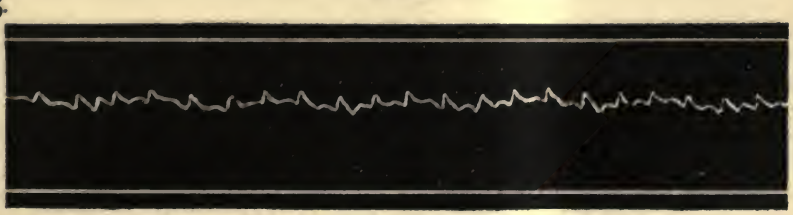
M. S.—One minute later, not so rapid, characters similar to No. 12. (4½ oz.)

14.



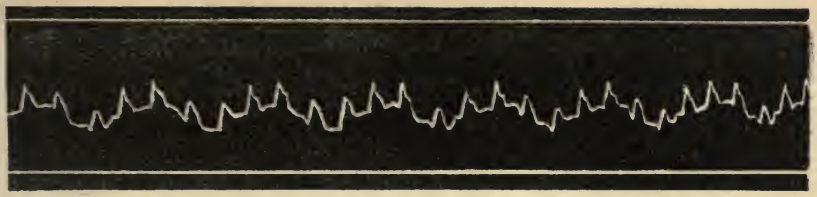
M. S.—One minute later than No. 13. Similar characters. (5 oz.)

15.



M. S.—Same pulse as in Nos. 12, 13, and 14, to show effect of a lower pressure. (2 oz.)

16.

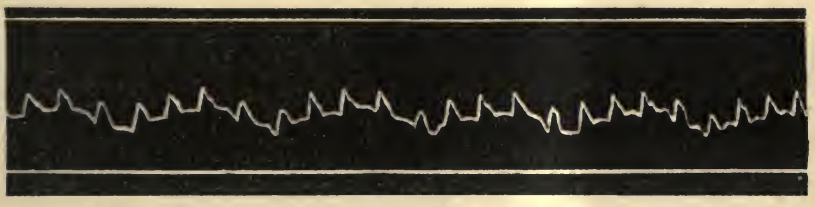


M. S.—In second stage of labour. Taken before a pain; dicrotic and hyperdicrotic in character. Respiratory curve very strongly marked, almost like that seen in spasmodic asthma. (3 oz.)

17.

M. S.—Taken two minutes after No. 16, during a pain; slowing of pulse, slight increase in tension. (3 oz.)

18.

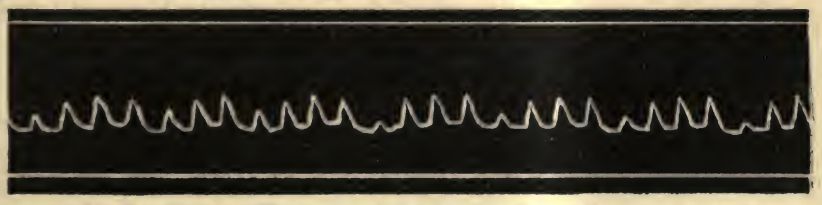


M. S.—Taken one minute after No. 17, same characters as No. 16. (3 oz.)

19.

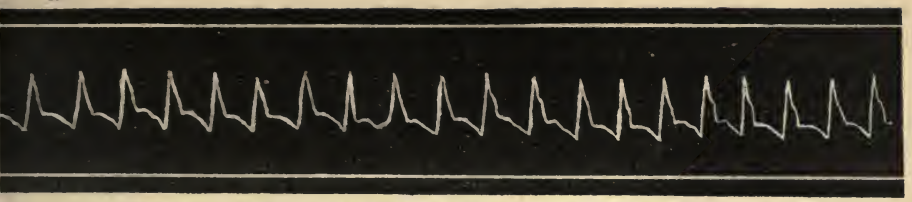
M. S.—Tracing taken nine hours after delivery, and one hour before death. Monocrotic pulse; pressure in this tracing was not great enough to bring out characters well. (1 oz.)

20.



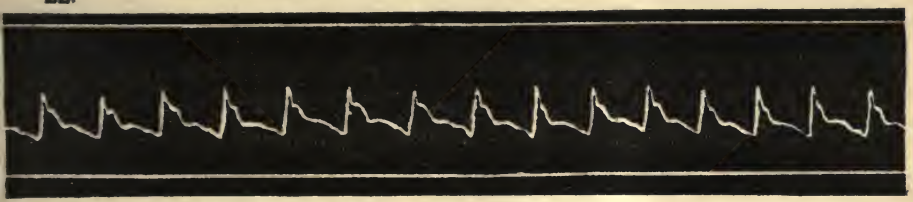
M. S.—Same. The second beat of a hyperdicrotic pulse is now lost, and pulse is distinctly monocrotic, regularly irregular. (1½ oz.)

21.



Mrs. W.—Tracing taken twelve hours after delivery by forceps. Straight up stroke—sharp apex—sudden fall to aortic notch—no tidal wave—feebly marked dicrotic—artery almost empty in diastole. (4 oz.)

22.

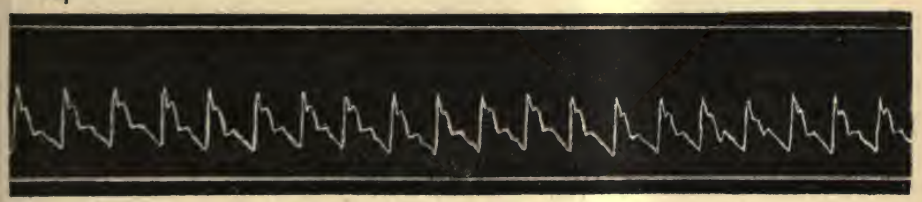


Mrs. W.—Evening of first day of Puerperium; slight predicrotic wavelet, patient taking digitalis, iron, and brandy; skin, kidneys, and bowels acting. (4½ oz.)

23.

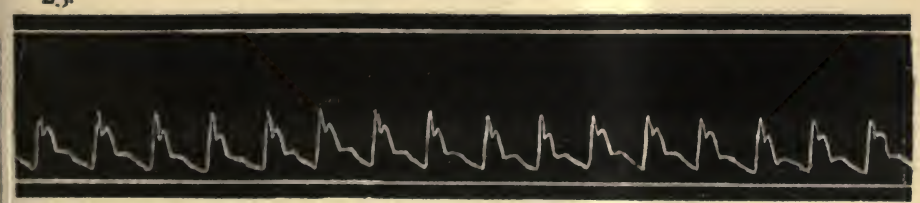
Mrs. W.—Second day of Puerperium; change in characters; tension increased; marked tidal or predicrotic wavelet. (4¾ oz.)

24.



Mrs. W.—Same as No. 23. (5 oz.)

25.

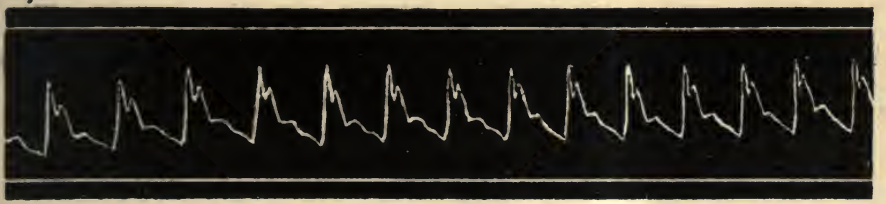


Mrs. W.—Second day of Puerperium, taken six hours later than No. 24, same characters. (4½ oz.)

26.

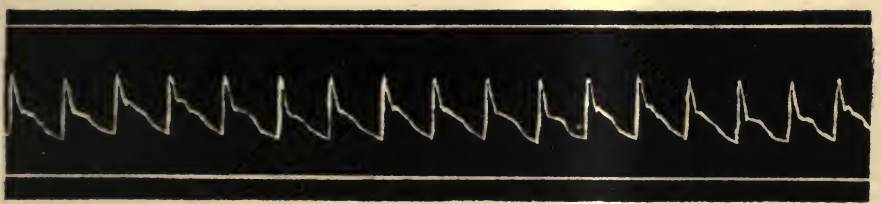
Mrs. W.—Same as No. 25. (5 oz.)

27.



Mrs. W.—Best example of high tension pulse obtained in second day of Puerperium, six hours after No. 26. (4½ oz.)

28.

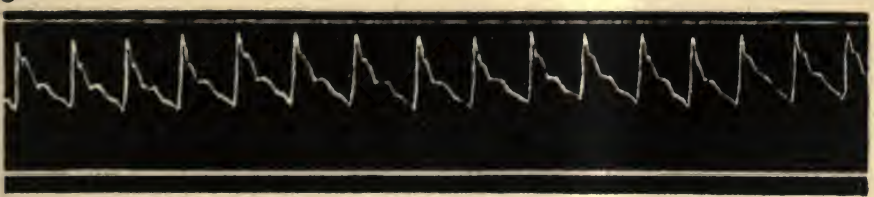


Mrs. W.—Third day of Puerperium. Temperature at this time 102° F.; low tension pulse resembling that of first day. (2¾ oz.)

29.

Mrs. W.—Third day of Puerperium; similar to No. 28. (5 oz.)

30.

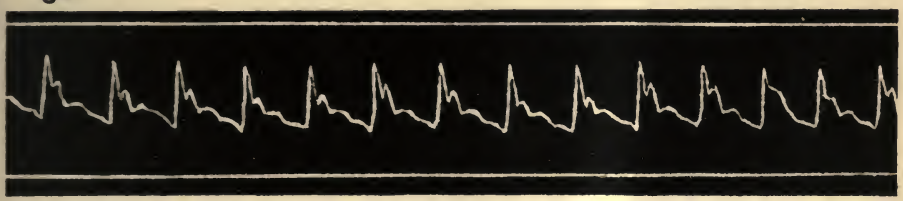


Mrs. W.—Fourth day of Puerperium; resembling the tracing on third day, but slight improvement in volume and tension. (3 oz.)

31.

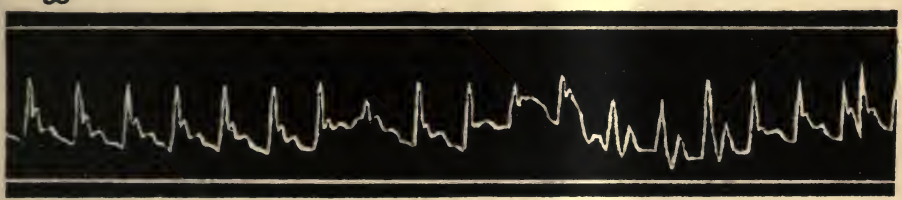
Mrs. W.—Similar to No. 30; up stroke bends slightly backwards. (3½ oz.)

32.



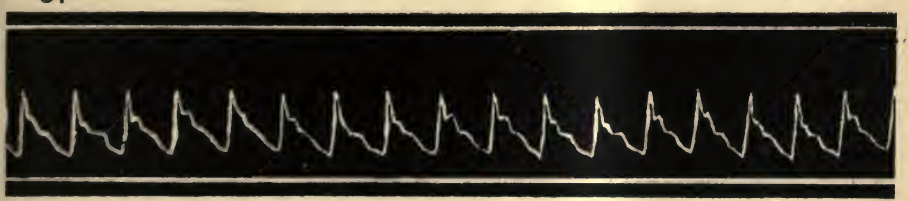
Mrs. W.—Fourth day, four hours after No. 31; improvement continuing, tidal wavelet better marked. (2½ oz.)

33.



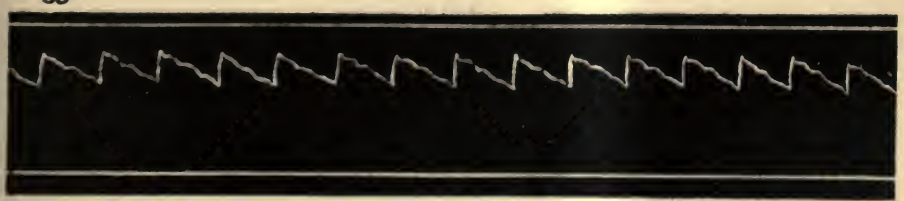
Mrs. W.—Fifth day of Puerperium. First day on which patient regained consciousness and intelligence; shows effect of cough upon tracing. (4 oz.)

34.



Mrs. W.—Sixth day of Puerperium; considerable improvement in tracing, line of descent more gradual. (4 oz.)

35.



Mrs. W.—Eighth day of Puerperium; high tension pulse of small volume, like pulse of chronic Bright. (4½ oz.)

side, and the arms and legs were rapidly flexed and extended. It was at this point that I was sent for.

On our arrival we found the patient lying passive, but breathing in a stertorous manner. The face was white and puffy, and there was marked œdema of the eyelids. As signs of an impending eclamptic attack appeared, the administration of chloroform was commenced. On making a vaginal examination I found the os almost fully dilated, the head low down and in the right occipito-anterior position, and the head mouldings very well marked. I determined to complete the labour as soon as possible, and therefore dilated the os digitally, pushed it up over the head, and applied the axis-traction forceps. I succeeded in delivering a large and healthy male child at 11.15 P.M., and removed the placenta from the uterus a few minutes afterwards. The anæsthetic was now discontinued, ergotin was given, and the vagina and uterus douched out with corrosive sublimate solution. During the application of the forceps there occurred several abortive eclamptic seizures, masked to a great extent by the chloroform narcosis. Twenty minims of ether were given hypodermically, as the pulse, which during labour was hard and full, was now very weak and thready. I had not my sphygmograph with me, so was unable to obtain any tracings during the labour. The temperature after the termination of the labour was 99°·6, and the pulse 82; breathing loud and stertorous. A few drops of urine were obtained, which contained a large percentage (75 per cent.) of albumen and some blood, was acid in reaction and dark in colour; epithelial tube casts also were found in small amount. She was ordered a mixture containing digitalis, iron, and squills, in order to get the kidneys to act, and croton oil to act as a purgative. During the first four days of the puerperium she lay in an almost comatose condition. The temperature continued high, ranging from 100° to 102° F., and the pulse varying in rapidity from 90 to 120 beats per minute, regular, but weak and dicrotic. She was given drachm doses of brandy, and as a distressing short cough developed itself, due to a certain amount of pulmonary œdema, an expectorant cough mixture was ordered. From the fourth day of the puerperium up to the present date (tenth day) she has continued to improve. She is now quite conscious, but has no recollection whatever of the dangers through which she has passed. She is suckling her child, and the cough and expectoration have almost disappeared. The urine now contains still about 10 per cent. albumen, is acid in reaction, has a specific gravity of 1030, and contains numerous fatty epithelial cells and detritus. Sphygmographic tracings have been taken during the progress of the puerperium, at first twice and thrice a day, and later on only once. The fact that the case was an extern one has prevented us making more extensive observations, but those that we have obtained are sufficiently interesting to merit a record being made of them.

Forty-five tracings in all were made: of these seven were taken during the first day of the puerperium, nine during the second, seven during the third, eight during the fourth, five during the fifth, four during the sixth, and five during the eighth day of the puerperal period. Those taken twelve hours after the termination of the parturition (Fig. 21) show all the characteristics of a moderately full pulse of low tension. The characters are best brought out with a pressure of four or four and a half ounces. The up-stroke is almost perpendicular, showing that the left ventricle is forcibly propelling the blood into the artery; the apex or primary ventricular wave of Mahomed is pointed; the line of descent then falls suddenly till the aortic notch is reached with only a slight indication of a predicrotic wavelet—this sudden fall being due either to the rapidity with which the blood leaves the arterial system and passes into the capillary districts, or to the presence of a certain amount of aortic regurgitation. The tracing, having in the aortic notch almost reached the base-line, rises again in a slight dicrotic or aortic systolic wave, giving thus to the sphygmogram the character of a feebly dicrotic pulse. In fact these tracings are not unlike those obtained in pernicious anæmia or in aortic regurgitation, the artery being almost empty during diastole. The pulse is regular, and has a rapidity of 120 beats per minute. Temperature was at this time 99°·6.

In the evening, when tracing 22 was taken, the temperature had risen to 100°·4. The pulse has now changed its character slightly. The apex is still pointed, and there is still a suddenly falling line of descent, but the descent is now more gradual, and is interrupted by a feebly marked predicrotic and by a dicrotic wave. She was at this time taking brandy, digitalis, and iron, which may account for the slight improvement in the tracing. The skin and kidneys were at this time acting freely, and there had been one motion of the bowels. On the second day of the puerperium, when nine tracings were made, the pulse curve showed a marked change (*vide* Figs. 23, 24, 25, 26, and 27). The tracings now show the characters of a pulse of high arterial tension, requiring a pressure of $4\frac{3}{4}$ or 5 oz. to make these characteristics manifest. There is a much more gradual line of descent interrupted by a well pronounced predicrotic wavelet and a moderately well marked dicrotic following the aortic notch. The pulse is much slower, is quite regular, and has all the characteristics of the tracings obtained in chronic Bright disease. The temperature during the second day of the puerperium varied from 100° to 100°·4 F.

On the third day of the puerperium there was again a sudden change in the characters of the pulse wave synchronous with a considerable rise in temperature, the thermometer registering 102° F. (*vide* Figs. 28 and 29). The tracings obtained on this day have all the characteristics of a low tension pulse. There is the

sudden fall from a pointed apex, the feebly marked tidal wavelet, the aortic notch close to the base-line, and the fairly well marked dicrotic wave.

On the fourth day, there was a slight improvement in the pulse wave, increasing as the day wore on. These tracings (Figs. 30, 31, and 32) have nearly the same characters as those taken on the third and first days of the puerperium. In Fig. 31 it will be noted that the up-stroke bends backwards, showing that the ventricular systole is sharp and sudden.

Five tracings were taken on the fifth day (the date at which she recovered consciousness and intelligence), which show a further slight improvement. The pulse, now much fallen, requires a pressure of 4 oz. or 4½ oz. in order to bring out its distinguishing features. Fig. 33 is interesting as showing the effect of a cough upon the respiratory base-line, there being a sudden rise in the pressure during the forced expiratory effort (*i.e.* the cough) and a fall afterwards.

On the sixth day there is a very marked improvement in the tracings, the line of descent being now much more gradual, and the predicrotic wavelet as well marked as the dicrotic (*vide* Fig. 34). A pressure of 4½ oz. is now required to make manifest the peculiarities of the sphygmogram.

The tracings taken on the eighth day of the puerperium show a pulse wave of a better tension than that upon any other preceding day of the puerperal period, with the exception of the second day. There is now a markedly high arterial tension, although the pulse itself is full (*vide* Fig. 35). In fact, these tracings closely resemble those taken during the pregnancy in the first case narrated in this paper, differing, however, in rapidity. The line of descent is much more gradual, and the aortic notch is high above the base-line. We may therefore conclude that the pulse in this case is returning to the condition in which it was before the advent of labour, and that the danger from the parturition is now nearly past.

From the preceding cases, although only three in number, we may venture to draw the following conclusions:—1st, That during a pregnancy complicated by Bright's disease, there is a pulse tracing of high arterial tension, even when the volume of the pulse is small; 2nd, That during the first stage of labour complicated by eclampsia, the sphygmographic tracings show a small pulse of high tension, usually regular, and closely resembling that seen in the rigor of acute fevers, and in peritonitis; 3rd, That during an eclamptic fit, at any rate during the tetanic part of it, the tension is considerably increased, as evidenced by a flattening of the apices and a prominence of the predicrotic wavelets, and the rapidity of the pulse is somewhat increased and the regularity lost; 4th, That during the intervals between the attacks the tension falls, and the pulse becomes slower and more regular; 5th, That if the first stage be prolonged and the eclamptic attacks be frequent, the

blood tension falls in a very remarkable manner, and the sphygmographic tracings become fully dicrotic and even hyperdicrotic; 6th, That this dicrotic pulse is also one of extreme rapidity (200 per minute), and very small volume, resembling the pulse in cases of severe hæmorrhage after typhoid and some other fevers; 7th, That during the second stage of labour in such a severe case the character of the pulse tracing remains the same; 8th, That the effect of a uterine contraction in the second stage upon the pulse curve is similar to the effect of an eclamptic fit, with this difference, that the pulse becomes slower and does not become irregular; 9th, That the effect of the stertorous breathing in such cases is to cause a rise and fall in the respiratory base-line, producing a sphygmographic tracing closely resembling that seen in spasmodic asthma; 10th, That after the completion of labour there is a great tendency to complete collapse, and that this unless checked will go on till death closes the scene; 11th, That in serious cases even the free use of stimulants proves insufficient to arrest this downward progress; 12th, That the sphygmographic tracings obtained immediately before death are distinctly monocrotic, from the quickening of a pulse of hyperdicrotic character; 13th, That in less serious cases where the patient is put under chloroform at once, and the labour quickly terminated by forceps or other means, a good result may be anticipated and the collapse lessened, if not quite averted; 14th, That during the first day of the puerperium the arterial tension is very low and the pulse curve dicrotic; 15th, That on the second day (thirty-six hours after death) the tension may rise in an extraordinary manner, so that the pulse tracing comes closely to resemble that seen in the pregnancy; 16th, That the pressure falls again on the third day, and the tracing becomes again fully dicrotic; 17th, That if suitable treatment be adopted, the tension gradually rises during the rest of the puerperium, until finally we again get a tracing of high tension like that seen in the pregnancy; 18th, That there seems to be no very clear connexion between the temperature and the pulse curve.

Dr Underhill had listened with much pleasure and profit to this paper of Dr Ballantyne's. The subject was a new one so far as he was aware, and he had no knowledge of any such tracings. It would only be when one had the paper in print that one could study it and appreciate its true value. He hoped Dr Ballantyne would continue these scientific observations. He had no doubt that they would throw light on this difficult subject, and, when published, would convey much information.

Dr Milne Murray complimented Dr Ballantyne on the skill and industry which has enabled him to get so beautiful a series of tracings. He agreed with Dr Underhill that it was impossible to pass an adequate judgment as to the value of the observations until the paper and tracings were printed, but he has no doubt that

they would prove an important contribution to this subject. He was glad to see that Dr Ballantyne had got so good and regular results with Dudgeon's sphygmograph. This instrument, though at first despised by physiologists and clinical observers, was rapidly gaining in favour; and he failed to see why, with proper use, it should not yield results equal to those of Marey's instrument, while the ease with which it could be applied and kept in position rendered it infinitely more convenient. With regard to the tracings, he observed that the pressures recorded varied greatly, and he would like to ask Dr Ballantyne whether he had not taken a daily series under the same pressure, as then they would be specially valuable for purposes of comparison.

Dr Neve thought that there were two sets of fallacies apt to arise in the use of Dudgeon's sphygmograph in cases of eclampsia. *Firstly*, The risk of not applying the button of the instrument exactly over the artery. *Secondly*, The danger of communicated movements from the clonic spasms of the flexor tendons. There also arose, he thought, in connexion with these tracings, the question of altered blood pressure from the universal muscular contractions. He thought that while the majority of Dr Ballantyne's valuable tracings were free of the two first errors, that some specimens showed them distinctly. He had made some observations on himself, by stimulating the muscles of the arm, by means of a faradic current, and then applying the sphygmograph, when he obtained extremely irregular tracings. [Dr Neve produced some of these, which were handed round.]

Dr Barbour was much impressed with the value of Dr Ballantyne's paper. It was a field of investigation which had been little worked, but the virgin soil was full of promise. The question of blood pressure during labour and the puerperium was of great practical importance, and he hoped that Dr Ballantyne would extend his investigations to the action of chloroform and ergot in modifying this. He wished to say one word as to the value of Dr Neve's criticism. So far as he could judge from Dr Neve's tracings, he thought that they conclusively proved that whatever was the cause of the remarkable appearances in those prepared by Dr Ballantyne, they were in no sense due to muscular twitching, as Dr Neve's and Dr Ballantyne's tracings seemed to have nothing in common.

Dr Angus Macdonald had used Marey's instrument as altered by Galabin in the observations he had made on the pulse some years ago, and was fully alive to the difficulties and inconvenience of the instrument. It was impossible to make reliable observations with it during the incidence of a uterine pain, and its application could not be dreamed of during an eclamptic seizure. He congratulated Dr Ballantyne upon the number and beauty of his tracings. With regard to the results, it was satisfactory to him to note that they bear out the ideas he had previously entertained as to

the character of the pulse in eclampsia—that is, that there was associated with the condition a small pulse of high tension, and which diminished in tension after delivery. So far as his observations went, the change in tension after delivery was not so great as Dr Ballantyne would seem to show. He was glad to note that a post-mortem had been obtained of one of the cases, and that the brain was to be examined. He had had great pleasure in listening to the paper, which he had no doubt would be even greater in the reading of it. He hoped Dr Ballantyne would continue his interesting observations.

Dr Ballantyne, in reply, said that he felt gratified at the kind reception given to his paper. With regard to the instrument used, he admitted the necessity of careful adjustment, and that some practice was required for its proper use. But there could be no doubt of its convenience in such cases, where the application of Marey's instrument was out of the question. He had now made with it more than four hundred tracings in obstetric cases, and these he hoped to bring before the Society at a future meeting.

MEETING IV.—FEBRUARY 11, 1885.

Dr J. CONNEL, *President, in the Chair.*

I. *Dr Macdonald* exhibited the LEFT HORN OF THE UTERUS AND FŒTUS, removed by laparotomy, and the subject of his paper.

II. *Dr Skene Keith* showed a LOBULATED FIBROID, removed from a patient some time since. There was not much bleeding, but the mass had, by its bulk, prevented the patient pursuing her occupation, and it was accordingly removed. The patient is now quite well and fit for work.

III. PULMONARY THROMBOSIS IN A PUERPERA.

By PETER YOUNG, M.D., F.R C.P. Ed., Lecturer on Midwifery and Diseases of Women in the Edinburgh School of Medicine.

SOME time ago I received a message late in the evening to come quickly to see a lady who was living not far from my own home. On arrival I found, to my surprise, she was in labour, the pains strong and frequent, and the os well opened up. She was requested to undress and go to bed, and half-an-hour afterwards was delivered of a strong healthy child. The uterus contracted firmly, and in a few minutes the placenta was expelled without any avoidable loss of blood. On inquiry my patient told me her

husband was a farmer in the north, that she had come to town to be delivered, and had intended calling on me to request my attendance in the usual way, but that labour had come on sooner than she anticipated. She appeared, however, not inclined to say much about herself, and had a melancholy, depressed look, as if some great care were hanging over her. She made no complaint, and said she now felt quite well. The pulse was small, occasionally intermittent and quick, about 90 in the minute. On leaving her the landlady told me my patient had called with another lady ten days before and engaged the rooms, and that she knew nothing of her antecedents.

Next morning I found my patient had passed a good night, and had slept several hours. With the exception of the pulse, which remained persistently small and quick, there were no unusual symptoms, and no pains or aches were complained of. She told me she did not intend to nurse the child, and had made arrangements to have it brought up in the country. This statement confirmed the suspicion which I had entertained from the first, that the domestic relations of the patient were not of a satisfactory nature. She made good progress during the next few days,—lochia normal, appetite fairly good, and with the exception of the listless, apathetic expression of the face and the small, somewhat quick pulse, there was nothing special to note.

On the fifth day she left her bed and lay upon a couch for several hours, and this she continued to do till the eighth day, when she dressed and sat up for three or four hours. On the evening of that day she went to bed about 9 o'clock, apparently quite well. Next morning, about half-past 8 o'clock, I received a hurried message to visit her immediately, and on arrival found her lying stiff and cold, death having taken place some hours previously.

The nurse informed me she spoke to her last on the previous evening at 10 o'clock, and thinking she was enjoying a quiet sleep, did not go near her till past 8 in the morning, when she found her lying dead, and sent for me. Judging from the appearance of the body, there had been no death struggle. The features were calm and placid, eyelids open and pupils dilated, the limbs semi-flexed, and body resting on left side in the attitude of natural sleep.

Under the circumstances there was no difficulty in obtaining a post-mortem examination, which was performed by Dr Littlejohn. Through the agency of the lady who accompanied her when she engaged the rooms, and who came to see her every day, her friends were communicated with, and from the brother of the deceased I learned the following particulars:—

Her husband, who had been a farmer in the north, died about seven years ago, leaving her and four children, the eldest of whom, a girl, was now 17 years of age, in very comfortable circumstances. The estate was left in the hands of three trustees, one of whom, a

bachelor, who lived near the beneficiaries, and who took the principal management, was frequently at the house, no doubt on legitimate business. By-and-by, however, he began to pay his addresses to the widow, and at last, under the promise of marriage, succeeded in seducing her. When she became pregnant her admirer not only refused to fulfil his promise, but even denied the paternity of the child. As may readily be imagined, this conduct would have a very depressing effect upon the widow, who kept all her sorrows to herself, so that not one of her relatives knew of her condition until they were informed of her death under the circumstances related above.

On making the sectio, the body was fairly well nourished, mammæ well developed and full of milk, areolæ dark, and the usual pigmentation over the linea alba, peritoneum and uterus also healthy, fundus at level of brim of pelvis, uterine and iliac veins, as well as vena cava, also healthy, but contained a good deal of dark fluid blood. Lungs healthy, pale, and mottled over with dark pigment. In the pericardium there was a teaspoonful of clear yellowish serum. Heart flaccid, and both ventricles filled with dark fluid blood; valves healthy and competent. Walls of the heart pale, soft, and distinctly fatty. They were very friable, more especially those of the right ventricle, which were thinner than normal.

The pulmonary artery, from its origin and for a considerable distance onwards, was filled with a soft dark-red clot, which was smooth and non-adherent, so that it could be drawn out of the vessel with a little care. The clot I have preserved, and have now the honour of showing it to you. This case appears to me to be of sufficient interest to bring under the notice of the Society, and to be well worthy of the careful consideration of its members.

The occurrence of clots in the pulmonary arteries, attended by more or less obstruction to the flow of the blood through them, has long been known, and a great variety of opinion has been expressed as to their origin:—1. From compression of the arteries in any part of their course; 2. Inception of septic matter, or from inflammation of the vessels caused by morbid processes in their neighbourhood; 3. Spontaneous coagulation from changes in the constitution of the blood itself; 4. From clots formed in other parts, generally the veins of distant parts being carried by the circulation into the pulmonary arteries.

Virchow in his masterly treatise, "Ueber die Verstopfung der Lungenarterie," maintains that the clots present in the pulmonary artery before death are always secondary, never primary, *i.e.*, they are always formed somewhere in the veins, often in those of the lower extremities and of the pelvis, or else in the right ventricle, and conveyed along the moving blood until they are arrested sooner or later according to their size in the branches of the pulmonary artery. He regards the occurrence of primary

coagulation of the blood in the pulmonary as impossible, except around an imported embolism. The flow of the blood maintained by the rhythmic action of the right ventricle is too quick and powerful to allow of primary coagulation. The chief cause of the formation of clots during life is, according to him, due to retardation or complete obstruction to the flow of the blood in any part of the vascular system; that this retardation is most apt to occur in the veins, more particularly those of the inferior extremities and of the pelvic region, and that the large thrombi thus formed, becoming detached—very often in consequence of comparatively slight muscular efforts, such as getting out of bed to urinate, etc.—are carried rapidly into the pulmonary vessels, and, according to their size and number, give rise to more or less marked symptoms. No one who has attended many sectios, or who has had a clinical experience of even moderate extent, can doubt that the pulmonary circulation is frequently embarrassed from imported clots. In this connexion I may be allowed to allude briefly to a case which occurred lately in my practice. A gentleman, æt. 45, in the summer of last year had a smart attack of rheumatic fever, from which he recovered, leaving, however, a systolic murmur, with occasional pains in the limbs and a feeling of weakness, as mementos of his illness.

In September he went to Moffat to recruit, but, unfortunately, caught a chill, which culminated in another sharp attack of rheumatic fever. With difficulty he was brought back to Edinburgh, and when I saw him he complained of great pain in the lower extremities, particularly at the hip and knee joints. The pulse was quick and hard, temperature increased, etc. From this attack, under the usual treatment of which the free administration of salicylate of soda formed the main feature, he gradually recovered, and was able to resume his duties at his office. In a fortnight thereafter, scarlet fever broke out in his family—all the children, six in number, with the exception of the youngest, a child twenty months old, being affected rapidly one after the other.

In a few days the father also was attacked by the disease in a well-marked form. On recovering from this he began to complain of occasional attacks of breathlessness, which obliged him to assume a semi-erect posture, with occasional cough, and the expectoration of a small quantity of partially rusty sputum. The breathlessness was always aggravated on lying down, so that, as night approached, he went to bed with considerable apprehension. This occurred for several nights in succession, when, one morning at two o'clock, he was seized with a terrible attack of dyspnœa, which obliged him to leave bed and assume the erect posture. When I saw him, he was leaning against the foot of the bed supported by his wife. The respiration was deep and hurried, the countenance pale and anxious; eyes staring, and pupils wide; cold sweat on face; pulse almost imperceptible at wrist;

hand cold and clammy; heart's action tumultuous; the air could be heard entering the lungs freely, and on the right side there was an occasional moist *râle*. The brain functions were not in the least obscured, and the patient complained of an intolerable sense of suffocation and of impending death.

The injection of a drachm of sulphuric ether into the muscles of the hip, and the administration of small doses of brandy and carbonate of ammonia, gradually restored the heart's action, with relief to the dyspnœa.

Noting the bad effects of the recumbent posture, I advised him to rest, propped up in an arm-chair, and not to attempt to lie down in bed, and this he continued to do for three weeks until all signs of breathlessness disappeared on tentative trials to lie down. I think the assumption of the erect or sitting posture in those cases is very important, as the muscles of respiration then act to much greater advantage, and the free expansion of the lungs, by facilitating the flow of the blood in the pulmonary vessels, will help much the labouring heart to perform its work.

Recurring, however, to the case which is the immediate subject of this paper, there can be no doubt, I think, that we have before us one of those comparatively rare instances of primary coagulation of the blood—in other words, of true thrombosis in the pulmonary arteries, to which the attention of the profession was first directed by Paget and Meigs, and more recently by Dr W. S. Playfair in the *Lancet*, 1867.

In the particular case under discussion, there were three main factors favouring the coagulation of the blood in the pulmonary arteries:—1. The fatty state of the cardiac muscle. 2. The depressed mental condition of the patient, which would tend to lower the heart's action. 3. The condition of the blood. As was long ago pointed out by Andral and Gavarret, the blood, especially in the latter months of utero-gestation and in puerpery, is deficient in coloured corpuscles and rich in fibrine. A similar condition of the blood obtains in most cachexia, so that when from any cause the flow of the blood is retarded, clots are more apt to form than when it is in a healthy condition.

Judging from the history of the case which I have just recorded, I am inclined to think that pulmonary thrombosis has different clinical features from those of pulmonary embolism. In pulmonary thrombosis we may have no indication of impending danger except in the condition of the pulse. The patient makes no complaint except probably of weakness, and death may occur during sleep without a pang, owing to the gradual stoppage of the heart's action.

I regret much that I did not examine the heart during life, but the patient was so averse to being disturbed that I refrained from interfering more than was absolutely necessary.

With regard to treatment, in addition to keeping the patient

quiet and strengthening the heart's action by the administration of digitalis and carbonate of ammonia, it is of primary importance not to allow the patient to lie down until all signs of dyspnœa have disappeared, or the heart's action is good.

In the recumbent posture, if there be any clots, whether primary or secondary, in the pulmonary arteries, the heart will experience more difficulty in driving on the blood, and there will consequently be a greater tendency for it to come to a standstill.

I have no doubt, in many of the cases of persons found unexpectedly dead in bed, death has occurred in the manner indicated, and which might have been averted if the sitting posture were adopted during sleep, until by the administration of appropriate remedies the heart's action is strengthened, and better fitted to perform its functions.

Dr Macdonald had listened with pleasure to the paper. The subject was one of great interest, and he thought that Dr Young had come to correct conclusions regarding it. He had seen two cases of thrombosis of the pulmonary artery. Both cases had been subjects of hæmorrhage after delivery. In the first case death occurred very suddenly. In the other the progress was slower and the symptoms of progressive agony were very great. Both proved fatal. It is of interest if Dr Young is correct in holding that some of the sudden deaths that occur are due to this cause. He, Dr Macdonald, was of opinion that these sudden cases were more probably due to embolism. He had recently seen a case in which a lady with mitral obstruction disease went into labour and required forceps. There was great breathlessness and cyanosis. Two days after she was seized with aphasia and paralysis of the arm, and two hours afterwards had a convulsion of the cheek. She has improved as to the arm, and is doing well so far.

The President asked as to how long after parturition the thrombosis may occur.

Professor Simpson was indebted to Dr Young for narrative of the case, which was a rare one. In Professor Young's lecture, in last century, he described a case which in the light of our present knowledge we knew to have been caused by thrombosis, but the nature of which was then unknown.

Dr Brewis showed a thrombus removed from the right ventricle of a patient who died suddenly on the eleventh day of her puerperium. The patient was a primipara, and her labour was an easy one, but she had suffered from acute rheumatism during the earlier part of her pregnancy, and the formation of the thrombus, which was evidently an ante-mortem one, was accounted for by the hyperinotic condition of her blood.

Dr Young thanked the Society for its reception of his paper. He believed we might have a thrombus occurring any time within three weeks.

IV. REPORT OF A CASE OF PREGNANCY IN THE LEFT HORN OF A BIFURCATED UTERUS TREATED SUCCESSFULLY BY HYSTERECTOMY, WITH OBSERVATIONS UPON THE NATURE AND THE PROPER TREATMENT OF SO-CALLED "MISSED LABOUR."

By Angus Macdonald, M.D., F.R.C.P. Ed., F.R.S.E.; Physician and Clinical Lecturer on the Diseases of Women, Royal Infirmary; Lecturer on Midwifery and Diseases of Women and Children, Medical School, Edinburgh.

The following case presents many characteristics of unusual interest, and is laid before this Society in the hope that it may help to clear up some points in a dark and disputed region of obstetrical science, and may contribute an additional fact in favour of what seems to me the proper treatment of such cases.

In the first instance I would begin, however, by frankly owning that I made an inexcusable but happy mistake in diagnosis. For reasons to be afterwards pointed out, I entirely mistook the true nature of the case. I believed I was dealing with a rapidly growing fibroid in the anterior wall of a small uterus. A little more care in investigating the history of the illness would readily have prevented me from falling into this blunder. But for the patient's sake I feel profoundly thankful I did come to an erroneous conclusion, as, had I not done so, I should not have had the courage, with the views I then entertained, to follow out what I now believe to be at once the boldest and the safest method of treatment, and, by adopting more seemingly accredited methods, should almost certainly have lost my patient.

I have recorded the case, not as we at first made out the history, but as we obtained it after very strict cross-examination of an unusually stolid and stupid patient.

The history we first made out was that the patient, having given birth to a living child at term three years ago, had noticed this lump gradually increasing in size during the last two years, whilst her menstruation continued regular. On examination I found the sound entered a cervix of the usual firm non-pregnant character the distance of a little over 2½ inches, and that a hard tumour, movable, smooth, and continuous with the cervix, without any bruit, occupied the abdomen. On these data, considering that a tumour of the uterus of a fibroid character had attained in a young woman such huge dimensions, and explaining the absence of excessive flow by the smallness of the uterine cavity, I came to the conclusion that it would be better to relieve her at once of this growth, which, if left alone, was certain to increase to such an extent as would seriously imperil the patient's life, and which would every year be more difficult to extirpate. How imperfect

our history had been will be seen in the sequel of the case, which runs as follows :—

Mrs B., æt. 23, residing at Slamannan, was admitted 8th January 1885, complaining of an abdominal tumour. The patient had been generally healthy previous to the present illness. She has been married four years, and has one living child, which was born on 9th March 1882.

So far as patient remembers, she menstruated for the first time after the child's birth in the end of February 1883. After this she did not menstruate again, but considered herself pregnant, and felt life first in June. On 1st January 1884 she had very severe pains, lasting with scarcely any intermission for three days. On the third day a red discharge appeared in lumps; one lump was bigger than the rest, and was pronounced by the doctor in attendance to be a bit of a *conception.* The discharge stopped on the following day, and the pains gradually left her. She remained in bed for three weeks at this time, and then resumed her ordinary duties. Menstruation reappeared in March 1884, and has been quite regular ever since. A bad-smelling yellow intermenstrual discharge appeared in April 1884, and lasted for about a day. This recurred in the following two months.

Physical examination, 11th January 1885.—The lower part of the abdomen is occupied by an oval solid tumour, freely movable from side to side, the long axis of which passes obliquely from the left downwards towards the right, bisecting nearly at right angles Poupart's ligament on the right side. Perpendicular height of the tumour above the symphysis is 8 inches. Its greatest breadth transversely is 7 inches. In the direction of its longest diameter it is 9½ inches. It extends 1½ inches above a transverse line passing through the umbilicus. No bruit is heard over any part of the surface. A flattened movable body is felt at the left side of the tumour not far from its upper extremity, apparently an ovary.

P.V.—The cervix feels quite natural, firm, but not fibroid, and runs into the abdominal tumour. The outer os is natural, and does not admit the examining finger to pass it. Sound passes upwards and backwards 2½ inches. The tumour encroaches considerably on the left broad ligament.

Assisted by Dr Caird, I proceeded to the operation of laparotomy on 26th January 1885. The abdomen was opened with ease; there were no adhesions to the tumour, which was connected inferiorly by a pedicle having the appearance of the cervix. The left ovary was situated high up in front of the left side of the tumour, the right ovary low down in the brim of the pelvis. Fearing that if the right ovary and tube were included in the ligature important organs would be injured, the wire of the clamp was passed between the right ovary and the tumour, and then tightened. On proceeding to remove the tumour by scissors, a yellowish-

brown semi-fluid material escaped. On further progress, an arm and the bared ribs of a fœtus were discovered in the interior of the tumour. The whole was removed with as great rapidity as possible, care being taken to prevent any of the semi-fluid material above mentioned from entering the abdomen. The pedicle was shortened further, and after sponging the abdomen carefully clean, the parts were brought together, the pedicle being secured in a Bantock's clamp in the lower angle of the wound. The surface of the stump was dressed with powdered iodoform and salicylic wool, and a bandage applied in the usual manner.

Description of Parts Removed.

1. *Description of Fœtus.*—The fœtus lay doubled up in the uterus, the neck strongly flexed, the lower limbs drawn up in contact with it. The head was contained in the left upper extremity of the sac, the breech being downwards and towards the right. The right side of the spine presented at what appeared to be the internal os, as did also the right elbow. The flexor aspect of the fœtus, including the head, left lower extremity, and left arm, were well preserved, and had the usual characters of a macerated fœtus; from the level of the spines of the scapulæ downwards, including the outer posterior aspect of the right leg, the soft parts have disappeared, laying bare the spinal column and the ribs, as also exposing a small portion of the left scapula, nearly the whole of right scapula, the arches of the vertebræ, and opening the elbow joint of the right arm. The fœtus weighed 5 lbs. 6 oz., and measured 19 inches. It was of the male sex.

2. *The Sac containing the fœtus,* of which a reduced drawing by Dr Caird follows this paper, was composed of ordinary uterine tissues covered entirely with peritoneum, and had the following dimensions:—Height 6½ inches, breadth 7½ inches, length of Fallopian tube 6½ inches, ovary 2 inches long, containing indications of an old corpus luteum. The walls were very markedly thicker inferiorly than superiorly, and they gradually and markedly *became thinner* as the upper part of the tumour was reached. About two-thirds of the tumour was situated to the left of the mesial line, as indicated by a slight wound received on making the abdominal incision. Towards the extreme left it terminated superiorly in a blunt rounded extremity. To its upper left anterior surface were attached the round ligament, the tube, and the ligament of the ovary. The insertion of the tube, however, which was highest up of the three structures, was considerably below the highest point of the tumour. No indication whatever of the origin of the right tube or of the ovarian or round ligament could be found in the part removed. The portion which formed the entire base of the tumour removed, which was triangular in shape and attached to the pedicle, was subsequently removed *en masse*

from the end of the pedicle above the wire. Its internal surface presented several honeycomb-like depressions. One of these, at the extreme right of the pedicle, perforated the thickness of the part cut off, and was found to be of oval shape, measuring in its greatest diamater 11 mm., and in its narrowest 5 mm. Only on some portions of the interior of the tumour could patches of membrane be made out. The placenta was clearly seen to be still adherent to the uterine surface, and connected to the fœtus by a very brittle funis. It was very much flattened, and almost papyraceous in consistence. Here and there, over the interior of the sac, there were thin plates of irregular shape and size, varying from a ¼ to ½ inch in breadth, made up of hard, brittle, adipocere looking material. The whole interior of the sac was smeared with brownish-yellow stuff. There was no appearance of any threatening to rupture in any part of the tumour, nor, indeed, could any specially thinned or deficient part be made out in the sac. The sac and placenta weighed together 1 lb. 8 oz.

The patient's recovery was uninterrupted. She complained of great pain during the first twenty-four hours, and had ⅛ gr. of morphia given hypodermically three times during that period. She had an unusually quick pulse in the evening of the operation, which was accounted for by some hæmorrhage having taken place apparently from the lower part of the wound. Patient passed wind on the second day. Bowels were moved on the eighth day after castor oil had been given. The deep stitches were removed on the tenth day. The stump fell off on the twenty-fifth day.

[On the 2nd of March vaginal examination revealed the cervix high up, and rather difficult to reach. The sound was passed, and entered upwards and slightly to the right a distance of fully 2¼ inches.]

The temperature rose on the night of the operation to 100°·5 at 8 o'clock P.M., but slowly fell to 99°·2 at midnight. From that point it gradually rose during the second day to 102°. On the morning of the third day it reached 102°·2, its maximum. After this it gradually fell, reaching the normal on the sixth day, and continuing so. The pulse throughout corresponded with the temperature.

Such, then, is the history of the case and description of the tumour and contents. It is abundantly plain from the history, the size, and especially the length of the fœtus, that this was a case in which utero-gestation had continued to the full term of pregnancy, and that the mature fœtus with its membranes had been contained within the uterus for over twelve months after the death of the child. Meanwhile certain changes of a decomposing character had been slowly taking place, and yet no putrescence properly so-called had occurred in the contents of the fœtal sac. Everything within it smelt per-

fectly sweet. That the sac did in some way communicate with the cervical canal was all but proved by the escape, if we can believe the patient, of some bad smelling matter on three separate occasions. That, however, the communication between the cervix and the sac was anything but free is proved both by the only indication of an opening in the upper part of the pedicle, which formed the entire base of the sac, being one which I show you, and which is only 11 millimetres in length by 5 millimetres in breadth, as also by the complete absence of putrescence in its contents. Had there not been nearly absolute separation between the cervical cavity of the uterus and the fœtal sac, it is impossible to believe that air would not have entered the cavity and have led to decomposition of its contents in the course of twelve months. That such putrescence is exceedingly apt to take place is abundantly testified by the numerous cases of so-called missed labour recorded by M'Lintock, Barnes, and others.

Two questions now arise—1st, *What have we before us in this sac?* and 2nd, *What bearing have our views regarding the case upon the nature and treatment of missed labour?*

Taking the former of the two queries first, it will be noticed that there is no room for doubt about the sac being uterine. It gives attachment to the uterine appendages of the one side, and is entirely covered by peritoneum, whilst the tissue is unmistakably uterine tissue. It will be observed, however, that the uterine appendages of the right side are entirely wanting. From the history of the operation it will be gathered that the right ovary and tube were situated low down on a level with the brim of the pelvis, and that, not caring to take so much tissue in the grasp of the wire of the clamp ligature lest I should include the ureters or other important organs, I passed the ligature to the inner side of the right ovary, and nearer the tumour than it.

It will also be noticed that though the tumour has been cut from its pedicle about 4 inches lower down than the level of the insertion of the left Fallopian tube, there is no trace of any portion of the right tube, broad ligament, or ovarian ligament of the right side upon the fœtal sac. Furthermore, it is to be observed that the tumour is not a symmetrical oval, but rather assumes the shape of a cone with a blunt point upwards towards the left, and its broad base low down towards the right side. I happened in making the abdominal incision to carry the knife rather carelessly, and in doing so to slightly graze the peritoneal covering of the tumour. This line, therefore, was without doubt in the mesial line of the body. It will be seen, on examining the specimen, that at least two-thirds of the tumour lie to the left of that line. This unsymmetrical disposition of the tumour was noticed before the operation, for, on recurring to the physical examination, it will be seen that it is stated that the tumour is obliquely placed in the abdomen. Its longest diameter, which passed from

above downwards from left to right, bisected the right Poupart's ligament nearly at right angles. Such an unsymmetrical disposition of the tumour was quite consistent with the notion of its being a fibroid. It was, however, not consistent with our ordinary notions of pregnancy, and it thus helped to distract my ideas from the possibility of pregnancy.

Another consideration of importance is that the wall of the cyst, instead of being thinner towards its lower segments and thickest of all at the summit, which is the case with the ordinarily pregnant uterus, is markedly thicker inferiorly than superiorly—in fact, gradually thins towards its highest point. All these facts demonstrate that the tumour is uterine, but at the same time that it is not made up of an entire uterus. There is, furthermore, nothing in favour of its being regarded as an interstitial pregnancy, as the tube is of ordinary length, and the uterine tissue well developed all over.

When thinking over the case I was very much puzzled what to make out of it, until on examining into the literature of Porro's operation I stumbled upon a case of Litzmann's recorded by Werth in the *Archiv für Gynäkologie*, Bd. xvii. S. 281. That case is so exceedingly like mine in almost all its particulars, with the sole exception that the tumour projected obliquely towards the right and upwards, whilst mine projected towards the left and upwards, that I feel certain it is of an identical nature.

Litzmann's case presented the symptoms of what is usually called "missed labour." The patient was 39 years old, had previously borne two living children at full time, just as my patient had borne one. When she came under Litzmann's care she had already passed three months the period when her delivery was due. The motions had ceased as the pains came on. On the suspension of fœtal movements, slight feverish symptoms, general uneasiness, and pain supervened. These rapidly disappeared, and the patient returned to her usual health. But, with some diminution of the bulk of the abdomen, a bloody discharge began to appear from the genitals.

On examination of the abdomen the following is the condition noted by Litzmann:—"The abdomen is occupied by a tumour of the size approximately of a uterus pregnant in the eighth month. The tumour is freely movable in the transverse direction, inclines somewhat towards the right, and rises there a handbreadth above the umbilicus. The tumour does not form a regular oval, but runs out towards the right and upwards into a blunt cone, the base of which passes over with a shallow inward bending in the mesial line into the left half of the tumour, which is less elevated and more rounded superiorly. The tumour is broadest at the umbilicus. Its consistence is hard, like a board, with the exception of the left prominence, which feels somewhat softer, and manifestly fluctuates."

P. V.—"The os uteri, a circular opening, bounded by short lips, is situated in the left posterior part of the pelvis. The examining finger can be passed through it 3–4 centimetres into the cervical canal, which, with a slight deviation towards the left, runs in the axis of the vagina, and gradually becomes narrower upwards. . . . . "The fœtal head is found resting at the brim of the pelvis. A markedly projecting suture in it is felt through the anterior cervical wall in the direction of the left oblique diameter. Over the examining finger there is poured out continuously a stream of thin, yellowish-red fluid, of a horridly stinking odour."

"The diagnosis was retention of a mature putrid fœtus inside the uterus."

Litzmann proceeded to remove the uterus and fœtus by the Porro-Müller operation, with Listerian precautions. The steps of the operation I need not refer to. But it is germain to my subject to observe that "on the extirpated fœtal sac there were found only the annexa of the right side. The pregnancy had therefore its site in one horn of the uterus. Whether the other half of the uterine structure was present, and in what form and connexion with the pregnant side, could not be determined by means of the observations made at the operation."

After two days the patient died, not apparently from anything directly traceable to the operation, but in consequence especially of the poisoned condition of her system by the putrescence of the tumour before operation. An opportunity was thus afforded to examine the parts remaining beyond the stump in the pelvis. What concerns us most of the sectio is the following:—

"The sewed-in stump, after loosening the wire loop constricting it, proved to be the remains of a right uterine horn. The left horn, whose body was bent nearly at a right angle to the cervix, and directed straight backwards, measured 6 centimetres (=2¼ in.) in length. Of this the neck took up 3½ centimetres. The circumference of the cavity at the external orifice was 5 centimetres, at the inner os uteri 2·5 cm. The thickness of the wall, which was uniform throughout, amounted to 1·5 cm. The tube belonging to this horn was 9 cm. long. The ovary, distant from the uterus 1½ cm., measured in length 4·5 cm., in height 3 cm., in thickness 2 cm., and contained a translucent cyst the size of a cherry.

"Just within the os uteri, which was markedly notched on both sides, there is situated to the right and forwards an opening the size of a *hempseed*, by which we could reach into the cavity of the amputated horn. This horn passes immediately from the right anterior surface of the left uterine neck, occupying with its insertion the entire length of the latter. The cavity (of the right horn) is very narrow immediately above the point of communication, widens upwards in a funnel-shaped fashion, and attains at the free end of the stump a circumference of 4 centimetres. The thickness of its walls here measures 2½ cm. The inner surface

of the cavity presents a surface which is spongy, soft, and somewhat roughened." See drawing annexed.

The only other extract I would make is from the description of the fœtus. "The fœtus in external appearance and bulk appears completely mature, and is of the male sex. The intrauterine process of decomposition has produced in it extensive destruction. The extensor aspects of the fœtus have especially suffered, in the trunk as well as extremities. In the latter the large joints have been laid bare, and in great part opened, through disappearance of the soft parts, the articular ends of the bones being robbed of their cartilages, and the periosteum of the bared bones deficient. On the back the skin and superficial layers of muscles are destroyed, the deeper layers of muscle and fascia softened and broken up into shreds. The arches of the vertebræ, the projecting edges of the scapulæ, and the crests of the iliac bones, are laid bare. The same is true of the head, in which the soft parts are wanting from the occiput, so that the back part of the occipital, and the posterior edges of the parietal bones project free. . . . . .

"The soft parts on the flexor side, including the face, are relatively well preserved, being in the same condition as in a fœtus which has been macerated intrauterine."

This case of Litzmann's corresponds closely with mine in almost every particular, except that in regard to the relation of the tumour to the abdomen we must put right for left, and left for right, and that there had been longer time for the uterus to shrink in my case. On reading that case my doubts all disappeared, and I felt perfectly certain that mine was an example of pregnancy in the left horn of a bicornuus unicollis uterus. Seeing my patient, like Litzmann's patient, had previously undergone a normal pregnancy and parturition, it is clear that in both cases one of the horns communicated freely with the common cervix. But, as was proved in Litzmann's case by the irrefutable evidence of post-mortem examination, it seems to me unquestionable that in mine also the horn in which the pregnancy had in the second instance occurred was connected to the cervix by an imperfect channel, which did not permit of canalization and delivery according to the ordinary methods.

By assuming that pregnancy occurred in the left horn of a bicornual uterus all difficulties vanish. Thus the asymmetrical shape of the fœtal sac, and the attachment of only appendages of one side, are easily understood; the appendages on the right would, of course, be connected with the right horn. The occurrence of the previous natural pregnancy is also easily explained, as it must have been contained in the other horn. The regular recurrence of normal menstruation is likewise traceable to the menstrual engorgement of the other horn. The fact that I was able to pass the uterine sound the normal distance is likewise

accounted for. I fully expect, when the patient is once completely recovered, to be able by clinical methods to prove the existence of the right horn, but as yet I dare not interfere with the course of the convalescence to the required extent.

[That this opinion was correct is shown above in the report, by my being able on 2nd of March to pass the uterine sound a distance of fully 2¼ inches.]

All astonishment regarding the possibility of such a pregnancy reaching the full time disappears also. Because, seeing that we have the certainty of regular pregnancy in the one horn demonstrated, we have only to assume that the vascular and muscular arrangements of the other horn were sufficient to permit of full-time pregnancy, although the cavity connecting that horn with the cervix was not sufficient to afford transmission of the fœtus into the common cervix.

The peculiar development of the walls of the fœtal sac is also explained by the consideration that the horn must necessarily be weak at its upper pole, which, as explained by Litzmann, must in consequence of the original oblique position of the horn be really developed out of a more and more distended upper segment of that lateral wall of the horn which is turned towards the mesial line.

Besides the case referred to of Litzmann, only two other cases of full-time pregnancy in a rudimentary horn have been recorded so far as I have been able to find out. Of these one was described by Professor Turner, and communicated to this Society in February 1866, in which the fœtus was carried to full time and then died. The death of the fœtus did not result in any marked discomfort to the patient so far as the report of Dr Scott of Dumfries, in whose practice it occurred, records. The patient died six months after the natural period of delivery ought to have occurred from phthisis apparently unconnected with the gestation. The uterus was removed with the contained fœtus in its left horn, and sent to Sir James Simpson apparently as a curiosity of extrauterine gestation. Its true nature was only found out some years subsequently by Professor Turner, when inspecting Sir James Simpson's museum on the hunt for bicornual uteri. In this case no channel whatever could be detected on the most close scrutiny leading from the common cervix to the pregnant horn. In Turner's case, as in mine, it was the left horn which had been imperfectly connected with the cervical cavity. In this instance, also, the dorsal aspect of the fœtus had suffered absorption or destructive changes, whilst the anterior aspect was well preserved.

The other case was operated on by M. Salin of Stockholm, and the only account I have been able to obtain of it is an abstract rather incompletely given in the *Centralblatt für Gynäkologie*, No. 9, 1881. It concerned a newly married woman, aged 23. She menstruated for the last time in April 1879, and expected her confinement in January 1880. At this period the movement of the child

ceased, after being specially active. In the end of February the patient experienced severe labour-like pains, which again stopped. In March she suffered from bleeding, continuing for eight days. On this supervened an attack of pain. The like occurred in April. In May there was pain, but no hæmorrhage. The abdominal tumour diminished in size from February, and the patient markedly lost flesh. On June the 4th she was admitted to Hospital. The abdomen was occupied in great part by a tumour extending from the symphysis to the xiphoid cartilage, on the right side passing along close upon the abdominal wall, and distending the right hypochondrium, whilst the hand could be inserted on the left between the tumour and the pelvis. The uterus was of normal size, movable, and anteflected. High up in the pelvis a small segment of the tumour could be palpated, from which there passed a broad pedicle to the supra-vaginal portion of the cervix uteri. The diagnosis was uncertain, but the case was regarded as most probably an extrauterine pregnancy, although the size of the uterus, as well as absence of the discharge of a decidua, were opposed to that view. The patient urged to be operated on.

The temperature was 102°·2; pulse 120. The operation was conducted with complete Listerian precautions, the spray being used. Nothing was obtained on tapping the tumour after it was exposed in the abdomen, but a portion of a fœtus presented at the opening thus made. This was enlarged, and the fœtus removed. The tumour was now brought through the wound, and proved to be the one-half of a double uterus connected by a broad pedicle with the other half. The pedicle was tied with a catgut ligature, and the sac removed. The free hollowed-out end of the pedicle was examined and sponged clean. There was no communication to be made out between it and the cervical cavity, or with the vagina. The surface was covered with decidua. This was cleaned off, and the edges brought together with catgut and the pedicle dropped, as there was no bleeding. The abdominal wound was then closed, and a Lister's dressing applied. The patient made a good recovery. The temperature for the first ten days varied from 102°·2 to 104°. After that the patient was free from fever.

There is yet another case in Dr Godson's list in the *British Medical Journal*, 17th January 1885, of a similar nature operated upon by Dr Sänger. But I have not been able to find an account of it, though I have carefully searched all Sänger's papers in the *Centralblatt für Gynäkologie*, 1882, in which Dr Godson says it is reported, as well as his papers contained in the same publication during the years 1883 and 1884. These three cases, however, show the practicability of operative removal in cases of full-term pregnancy in a bicornual uterus. It is quite plain that it would have been easy to have removed the tumour in Professor Turner's case had the nature of the lesion been

suspected, and had abdominal surgery been at the time in its present advanced condition.

Let me now try to answer the second query, viz., *What bearings have our views regarding the case upon the question of "missed labour?"* —Missed labour has been the subject of not a little discussion. It is, doubtless, difficult to understand how such a phenomenon could arise.

It is quite foreign to the experience of obstetricians in dealing with difficult and laborious cases to find that the uterine pains should come and go, and the uterus quietly subside again into inactivity without further immediate results.

The all but universal experience is that either the uterus ruptures itself, or, becoming inflamed, the patient dies of fever and exhaustion, along with her unborn child.

The question of missed labour is a very different one from that of missed miscarriage. In cases of death of the fœtus occurring before the completion of normal pregnancy, retention of the included ovum is not at all uncommon. I recently, through the kindness of Dr Peddie, was able to show you a dead fœtus and membranes, which did not appear older than three or four months, and yet had been unquestionably carried in the uterus six or seven months. Since that occasion I have had an analogous case in my own practice, in which the fœtus, however, had disappeared early, and the membranes were carried for five months or so. This is particularly apt to happen in the case of one of twins. Normally death of the fœtus during pregnancy is not followed by its expulsion earlier than from fourteen to twenty-one days.

But it is very different when we turn our consideration to cases of missed labour. Then we must assume that the uterus has become completely developed in its muscular, vascular, and nervous arrangements, so that under the influence of that law of maturity under which it comes into contraction at the end of the period of utero-gestation, it shall contract in opposition to the resistance offered to the expulsion of its contents, until it either succeeds in emptying itself, or perishes in the attempt. Nevertheless, a number of carefully observed cases have been reported where the uterus seemed to fail in this effort.

Restricting ourselves to modern times, Oldham,[1] Montgomery,[2] Menzies,[3] M'Lintock,[4] Duncan,[5] and, if I may be allowed to differ from his reading of his case, Barnes,[6] etc., have, among our own countrymen, watched such cases. In France, Germany, and America similar observations have been made from time to time. But it seems hardly necessary for me in this paper to refer to these

[1] *Guy's Hospital Reports*, vol. v., 1847, pp. 105-112.
[2] *Dublin Quarterly Journal*, vol. xxxvii. p. 55, 1864.
[3] *Glasgow Medical Journal*, vol. i., July 1853, p. 129.
[4] *Dublin Quarterly Journal*, vol. xxxvii. p. 51, for 1864.
[5] *Clinical Lectures*, second edition, p. 24.
[6] Barnes, Robert, *London Obstet. Trans.*, vol. xxiii. p. 81.

more particularly. In these cases the pregnancies have proceeded to the full time; the uterus has been proved to contain the parts of the child, or at any rate the parts of the dead fœtus have, in a large number of the cases, been expelled or removed through the natural cervix uteri.

In a very clever essay, published as a thesis at Paris in 1878, by Dr E. Müller of Nancy, an attempt is made to prove that all these cases were really extrauterine pregnancies which had ulcerated into some portion of the genital tract, and had thus deceived the various observers. I have looked over his essay with some care. It is doubtless interesting and thoughtful, but shows much of the rashness of partially-educated youth in its hasty inductions. He attempts to prove too much in his endeavours to make all the various facts square with his theory. In this he is greatly aided by a lamentable looseness in the anatomical details of almost all the autopsies recorded hitherto. But the breadth of his view may be learned from the fact, that he declares a case to be undoubtedly extrauterine if menstruation is coincident with the retention of the fœtation in the abdomen. That one fact shows he has something to learn on the subject of pregnancy in a subsidiary horn.

I believe a proportion of such recorded cases may belong to the category to which Dr Müller would refer them all; but I dissent entirely from his sweeping inductions, and do not think he gives due credit either to the ability or the care of the very numerous and distinguished observers he proceeds to criticise. On the contrary to Müller, I have come to the decided conclusion that the bulk of these cases were really and truly intrauterine, the fœtus being developed in one horn of a bifurcated uterus. This conception of the case meets almost every possible requirement.

From the advanced destruction of parts in those few cases subjected to sectio, and, so far as I have been able to notice, from a complete neglect of observing the relations of the uterine appendages to the fœtal sac, it is easy to understand that a small uterine horn may not have been observed in any of them. On the other hand, from the experience of Litzmann and myself, it is easy to imagine that such a horn might be flattened out on the uterine tumour, or displaced so as to have been overlooked in those cases in which no post-mortem examination was allowed.

In a number of these unicornual pregnancies it is true, no doubt, that the horn ruptures early, as occurred in the former of the two cases recorded by Turner; but if the bifurcation divides the organ nearly equally, there are afforded, as Turner's, Litzmann's, Salin's, and my own case prove beyond cavil, conditions which permit the pregnancy to advance to the full time without rupture.

If, then, there is either an *absence* of tubular communication between the one horn and the common cervix, or if that connexion though present is *radically narrowed and incapable of dilatation*

by the uterine contractions, labour becomes impossible, no progress whatever is made under the influence of the pains, the fibres have no opportunity to recover force when out of tension, as happens in ordinary labour cases, when the cervix opens up under the influence of the pains, and consequently the uterus rapidly gives up work by exhausting its contractility.

In the cases recorded by Turner and Salin, communication between the fœtal sac and the common cervix was seen to have been non-existent. In Litzmann's case and in mine, the cavity appears to have existed in an extremely rudimentary condition, not admitting of the possibility of dilatation. In cases such as Turner's, a difficulty arises about fecundation. According to Kussmaul the communication, though previously existing in these cases, must have been blocked up by inflammatory adhesion during the pregnancy. But Turner does not agree with this view. He is of opinion that impregnation must have taken place through the Fallopian tube of the horn whose pedicle was blind, either by that tube getting displaced on to the other ovary, or by the transmission of semen through the abdominal cavity from the other tube into it. The same remark would apply to Salin's case if his observations were accurate; but the statement is so brief that we cannot make certain of this. As a practical obstetrician, however, the greatest objection to the accepting of Turner's explanation appears to me to consist in the difficulty of understanding how a shut sac of that kind, capable of accommodating and developing a fœtus, would not give rise to trouble by the formation of hæmatometron, as it must be subject to the ordinary menstrual flux. In Litzmann's case and in mine, the communication between the impregnated horn and the cervix, although too small to give exit to a fœtus, appears to have been sufficiently large to admit the passage of semen.

In favour of missed labour it has been urged that the same phenomenon is seen to take place in some of the lower animals, such as the cow, the sheep, and the goat. It is always somewhat dangerous to argue in favour of any physiological or pathological condition in the human subject from what occurs in animals, whose physiological and anatomical arrangements are so different. In the present instance the argument seems exceedingly, and, indeed, glaringly faulty. In the cow, the sheep, and the goat the type of uterus is normally bicornual. The occurrence of occasional obstruction through defective communication between one of these horns and the common cervix might, accordingly, be anticipated in them. Holding, therefore, as I do that so-called "missed labour" is nearly always due to such accident, I maintain that its occurrence in these animals affords strong presumptive evidence that my contention is correct. Doubtless, as in these animals the bicornual condition is the normal one, we should not expect that irregularities of development would be found

relatively so frequent in them as in the bicornual uteri of women, in whom the bifurcated condition is itself abnormal, and therefore likely to be associated with other developmental defects. This, to my mind, sufficiently explains the rarity of this accident in the lower animals, for it appears to be undoubtedly a rare occurrence in them. This explanation is so exceedingly obvious, that I am surprised it has not before now suggested the idea of missed labour being due to arrest of the fœtus through defect in one of the horns of a bicornual uterus, whose other horn was capable of normal delivery.

The possibility of patients suffering from so-called "missed labour" having had previous natural pregnancies, of the occurrence of stinking discharges and fœtal parts issuing through the normal cervix, of feeling the parts of the fœtus through a true, though, of course, specially narrowed cervical canal, the possibility further of natural menstruation, and even of natural pregnancy occurring, while a dead fœtus is in another part of the uterus, are all cleared up by this view. I believed my patient mistaken when she said she menstruated, but now I understand she spoke the truth. I believed also I was mistaken in thinking I catheterized a uterine cavity measuring 2½ inches, but now I know I was correct.

It is to be noted, in support of this view, that in Dr M'Lintock and in Barnes's cases, as well as in Menzies's, and I have no doubt in others, the dilatation of the internal os uteri presented very unusual and unlooked for difficulty—in fact, appears in these cases to have been impossible with ordinary means.

All this is made easy the moment we allow that these obstetricians had to deal with a pregnancy in a subsidiary horn presenting a defectively developed communication with the common cervix; and we have thus a rational account to give of the difficulties experienced, without going to what seems to me the unwarrantable supposition that these experienced observers were deceived in regarding the fœtal parts as contained in a sac formed by the pregnant uterus.

An explanation of the greater readiness with which the uterus may cease to act in such pregnancies is, I think, suggested by examining the diagrammatic view here presented of the uterine tissue. In ordinary circumstances the fundus is thicker and more powerful than the lower segment of the uterine body. In ours, as in Litzmann's case, the reverse is the truth. The walls are very powerful round the lower pole of the fœtal sac, and become gradually weaker as we approach the upper pole. Uniform contraction of the uterus, under ordinary circumstances, is followed by a dragging up of the lower segment of the uterus towards the more powerful fundal segment, and thus dilatation of the upper pole of the cervix is facilitated. But uniform contraction of a muscular sac, such as the one before us, would be followed by pulling of the fundal zone downwards towards the more powerful cervical zone, whilst the same preponderance of tissue would tend to shut the internal os

more and more tightly instead of facilitating its dilatation. In this way it seems tolerably clear that the weak fundal zone would be very apt to get soon exhausted and to cease acting much more readily than in a normally developed uterus. This view is further supported by the fact of experience, that when bicornual pregnancies burst it is in the situation of the upper part of the sac.

The greater tendency to decomposition in the flexor aspects of the fœtus is explained by Litzmann by the greater and ever increasing tension which this aspect undergoes while the sac is gradually contracting. In this view I agree with him. It was markedly present in Turner's case, as also in Litzmann's and in mine. It was also noticed by Litzmann in a case of abdominal pregnancy.

Diagnosis.—In my case the great length of time after the death of the fœtus leading to involution of the cervix, the absence of discharge of a bad-smelling character, and the regular recurrence of menstruation, with the possibility of catheterizing a uterus of normal size, combined with the imperfect history and some inexcusable neglect on my part, led to an erroneous conclusion. This was further facilitated by the fact that the part pressing against the lower uterine segment was the breech and not the head, which gave no feeling of bones or sutures, and felt exactly like a fibroid. Still, I frankly allow that a little care in inquiring into the history would have suggested the possibility of pregnancy, or rather the probability. Further than that we could not have gone on the merits. The fact of what was called by the doctor in attendance a conception having passed further complicated matters, and made the case more obscure. It must have been the decidual membrane from the unimpregnated horn, but might also have been the conclusion of the pregnancy. As to the diagnosis in general of the bicornual condition, the possibility, as in Salin's case, of finding a uterus empty, ought to suggest either bicornual or abdominal pregnancy when the fœtus is carried to the full time. The presence of free lateral mobility would, I think, make nearly certain of a pregnancy in a bifurcated uterus; for we well know that an abdominal pregnancy being situated in a sac formed from inflammatory exudation must necessarily be pretty firmly fixed. It is only the abdominal, of the various extrauterine forms of gestation, that can go on to or near the full time. The obliquity of the tumour is also of considerable importance, as from their anatomical conditions the horns of a bifurcated uterus are inclined at a considerable angle to one another and to the mesial line; consequently, as one or other develops in its own axis, the direction of the resulting tumour must always be oblique.

Thus, to collect the most important diagnostic considerations, the history of a pregnancy advancing to full time before the death of the fœtus, with failure of the uterine efforts to complete the delivery, no demonstrable obstetrical obstruction being present, ought to suggest the possibility of a pregnancy in a bifurcated uterus.

The presence of marked obliquity in the abdominal tumour, free lateral movement in the same, the history of a previous pregnancy or pregnancies natural and at full time, ought to strengthen the opinion. If, moreover, menstruation goes on regularly notwithstanding that an apparently "missed labour" has occurred, this fact confirms the opinion, and ought to set the obstetrician to work by abdominal, vaginal, or anal examination to determine the position and condition of the other horn. That being determined leads us to the question of

Treatment.—This I hold should be laparotomy, not only for those cases that are diagnosed as pregnancy in a subsidiary horn, but for those that, in the present position of opinion, are usually called "missed labour." As I have already pointed out, I regard all, or nearly all, the cases of so-called missed labour to have been cases of pregnancy in a subsidiary horn of a bifurcated uterus. Nothing else to my mind can account for all the conditions. But it can. If we consider the fearful mortality of so-called "missed labour," we shall have no difficulty, I think, in reconciling ourselves to this mode of treatment.

Laparotomy with simple removal of the entire unopened sac, as in my case, is suitable for those cases when, after many months or even years, the containing sac has shrunk so far as to make this practicable. But for the more recent cases, it seems to me that to facilitate the delivery the opening of the sac and removal of its contents previously to the permanent ligature of the pedicle may be advisable on technical grounds, that is the employment of either the Porro or Porro-Müller method.

The only other admissible treatment of such a case as mine would be to let it alone. But when we consider the very advanced state of destruction in which the membranes and parts of the fœtus were found, and collate that fact with the disastrous histories of most of the cases of so-called missed labour, the prudent obstetrician will, I feel satisfied, give the weight of his opinion in favour of early operation, so as to avoid the risks of putrescence of the contents of the sac and consequent blood poisoning, or those of ulcerative perforation of the sac, the dangers connected with which are known to be very great. If Litzmann's case had been operated upon sooner, there is every reason to believe that all would have gone well, as the patient, to judge from the record of the sectio, manifestly did not die of the operation, but of the infection of her system before it was attempted. Salin's case did excellently, so apparently has an as yet unrecorded case of Sänger's. Mine could not have done better. In such an operation a mortality of 1 in 4 is certainly not large.

It is to be remembered that as the placenta is included in the tumour to be removed, one of the greatest risks attendant upon operation for extrauterine pregnancy is non-existent when we deal operatively with pregnancy in a subsidiary horn of a bifur-

cated uterus. Besides, the principle urged here is in accordance with the universal axiom of midwifery, viz., that by all means a patient whose labour comes on at full term must be delivered—as safely as practicable—but she must never be left undelivered.

Before concluding I would beg to express my deep obligations to Dr Caird for the accompanying drawings in illustration of the paper.

Addendum.—Since writing the above, I find I have overlooked the following references in which the same idea as I have endeavoured to bring out in the paper is indicated.

"After Oldham, these prolonged pregnancies with a dead fœtus are called *missed labour* (most probably in these cases there has occurred a confusion with fœtuses retained in extrauterine subsidiary horn pregnancies)."[1]

"I entertain little doubt that some cases of presumed *missed uterine labour*, a part of whose history is the subsequent discharge of fœtal bones by the os uteri and vagina, were cases of interstitial gestation, or of gestation in one horn of a two-horned uterus."[2]

Professor Simpson said that cases of bicornuus uterus were rare, and it was still rarer to have pregnancy occurring in them. It was only within recent years that we could have met with them as Dr Macdonald had done, and it is only within that time that surgeons could have been prepared to deal with them. Now that the abdomen is being so frequently opened into, we may expect to meet them more frequently, and that the records of such cases may multiply. He was sure the Society was indebted to Dr Macdonald for the care with which he had recorded the facts of this case. It was interesting to note the presentation of the fœtus. The head was prevented presenting by the peculiar shape of the uterus, and the fœtus had adapted itself to the segment in which it lay. Dr Macdonald had made out a good case as to missed labour being explained by the pregnancy occurring in a horn of a bicornuus uterus.

Dr Skene Keith mentioned a somewhat similar case in which Dr Thomas Keith opened an abdomen expecting to find a fibroid tumour, but on cutting into it a fœtus was found. This was a case of tubo-interstitial pregnancy where the fœtus had been dead for nearly two years. The patient made a good recovery.

Dr Hart had had the good fortune to witness the operation. He had had a difficulty in accounting for the absence of an ovary, but Dr Macdonald's explanation made it plain. It would be important if Dr Keith would examine the specimen to which he referred, and see whether it presented similar features to that of Dr Macdonald's case.

The President was sure there was room for congratulation when

[1] *Kleinwächter Grundriss der Geburtshülfe*, s. 190, Wien, 1877.

[2] Barnes's *Diseases of Women*, 2nd edition, p. 368, London, 1878.

Diagrammatic section through Uterus, to show the Left Tube, etc., the wall thickened below, but thin above.

After Litzmann.
Empty horn, *a*.
Pregnant horn, *b*.
Communication in line of the arrow.

Tumour viewed from left anterior aspect, stuffed with cotton wool to restore its original form.

a. Left round ligament. *b*. Blood-vessel.
c. Left Fallopian tube. *d*. Left ovary.
e. Line of separation of tumour from pedicle.

DR. ANGUS MACDONALD'S CASE OF PREGNANCY IN LEFT HORN OF A BIFURCATED UTERUS.

J. Bartholomew, Edinr.

one considered the changes which had occurred in practice in the seventeen years since Professor Turner brought the specimen to which Dr Macdonald referred in his paper. He thanked Dr Macdonald very heartily for bringing forward this case, marking, as it did, so great an advance in obstetrics.

Dr Macdonald thanked the Fellows. He felt satisfied that we had in the history of this case a sufficient basis for diagnosis in similar cases, and that in future we might with care arrive at a reasonable degree of certainty. He thought also, all things considered, that the view urged regarding missed labour would not meet with general acceptation.

MEETING V.—MARCH 11, 1885.

Dr J. CONNEL, *President, in the Chair.*

I. *Dr Angus Macdonald* showed the following preparations :—

1. FIBROID ENUCLEATED FROM THE POSTERIOR LIP OF THE CERVIX. —The first preparation represents what was at one time a fibroid tumour connected with the posterior lip of the uterus. It must have been growing for a long time, and yet the patient had not experienced any trouble from it till a few weeks before she applied for admission. The leading symptoms were those of down-bearing and retention of urine. On examination a tumour nearly the size of a child's head was found filling the vagina. It looked like a large fibroid polypus. But on chloroforming the patient it was found that the outer surface of the tumour was continuous in all directions with the bladder except for a small portion anteriorly. Then it passed into a cavity which just admitted the tip of the forefinger. The sound entered here $2\frac{1}{2}$ inches into a hard body like the uterus, which projected into the abdomen above the brim. The uterus itself was clearly not fibroid. The tumour was removed first by cutting into it, and breaking it up piece by piece, until the finger could be pushed through the centre to the base of the mass where it was completely enucleated. Into the bottom of the sac a plug of cotton wool, previously saturated in styptic colloid, was inserted, and the vagina plugged with pieces of cotton wool steeped in carbolic solution. These were removed next day and the vagina washed out with an antiseptic solution. There was no hæmorrhage. The patient left the hospital a week after the operation, the cavity having disappeared, and the uterus having gone back to its natural site. The fragments weighed 1 pound 14 ounces. The preparation is shown to the Society because it is rare to find so large a fibroid growing from the cervix alone—fibroid tumours usually affecting the body of the uterus. Such a

tumour must have seriously interfered with delivery, but it could of course have been enucleated, and thus got out of the way.

2. Entire uterus removed by vaginal method for cancer.—The specimen shown represents the uterus of a patient suffering from cancer, removed by the vaginal method on Monday, 23rd February 1885. The cancer was restricted to the uterus. The uterus was movable to a considerable degree. There was some old contraction in the left broad ligament. The method adopted was first to depress the uterus with volsellæ, free the vagina from the cervix by the knife, and reflect the bladder with the fingers from the part of the cervix up to the reflection of the peritoneum from bladder to uterus. Then the posterior vaginal wall was separated by knife, and Douglas's pouch exposed and then opened. The base of the broad ligament on both sides was then first tied in position with strong silk, and divided until the finger could be easily passed over the top of the left ligament, when the anterior pouch of peritoneum was opened, and the upper part of the left broad ligament was transfixed and tied firmly in two portions, and finally separated from the uterus. This allowed the uterus to be pulled sideways outside the vulva, and the remaining upper half of the right broad ligament to be transfixed and firmly tied in two portions. All risk of cancerous infection from inversion of the connecting stump upon the peritoneum were thus avoided. The ligatures on the left side inserted into the lower end of the broad ligaments were rubbed off in removing the uterus, and caused slight bleeding, which was readily averted by transfixing the mass and retying. The ligatures were tied together, right and left, in two bundles and drawn out. There was very little bleeding. The opening in the peritoneum was not drawn together, but the vagina was plugged with iodoform wool. The patient did excellently for two days. There was very little shock and no peritonitis. But on the third day—apparently in consequence of some carbolic oil having been put on a small iodoform plug that was used—sepsis set in, and the patient died twenty-four hours afterwards. There was no injury to either bladder or ureters, as plenty of water was passed by the bladder, and its colour was natural. It seems to me that the difficulty of this operation, as well as the amount of shock expected to follow it, are somewhat exaggerated in the professional mind.

3. Uterine fibroid in anterior wall.—The third specimen is that of a bleeding fibroid growing from the anterior wall of a uterus, removed on Saturday, 28th February 1885. The tumour is remarkable for the way in which it has developed forwards so very markedly—growing at the same time downwards so as to encroach upon the cervix and bladder. The cervix was very short. But as the patient had nearly bled to death at the menstruation immediately preceding the operation, and was, moreover, very anxious to be operated on, I granted her her request. There was some trouble in keep-

ing the wire of the clamp above the edge of the bladder. There was also some trouble in getting the tumour hoisted out of the pelvis, into which it had got wedged. But ultimately a workable pedicle was obtained. The patient has uninterruptedly done well.

4. Fœtus delivered by craniotomy and basilysis at the Royal Maternity.—The mother of this child presents an extreme example of the flat rickety pelvis. The conjugate at the brim is not over 2¼ inches. The patient was delivered by basilysis, by Dr Croom, two years ago nearly. She was sent into the Maternity by Dr Stewart Stirling, who had applied forceps and failed. She had been eighteen hours in labour before coming to us. The head had not attempted to enter the brim, but rolled over the inlet, the sagittal suture parallel to the transverse but near the promontory, occiput towards the left. Cervix fully dilated. I resolved to perforate. This was easily accomplished, but it was difficult to break down the skull with forceps owing to the small size of pelvis and high position of the head. After considerable progress was made in comminuting the skull the basilyst was used. It was very difficult to screw it home, as the part of the head entered became oblique. It fixed in the left temporal and broke it up. The head could thus be pulled through with the crotchet. It was very difficult to make the shoulders pass. The patient did well.

II. *The Secretary* read the following communication:—

NOTES OF A CASE OF FACE PRESENTATION, WITH PECULIAR ATTITUDE OF THE FŒTUS.

By James Hewetson, M.B., Reigate.

On the 4th of December 1884 I was called at 9 P.M. to attend Mrs N., aged 30, in her fourth confinement.

Patient informed me that her three previous labours had been absolutely normal, the first two lasting an average time, and the third lasting only a few hours,—the child being born before the arrival of her medical attendant.

I also ascertained that during her present pregnancy patient had enjoyed fair health; but that, during the last month, she had been disturbed by an unusual degree of prominence of the uterine tumour, and by the unusual turbulence and frequency of the fœtal movements.

The present labour began about 6 P.M., and on my arrival at 9, I found her still in the first stage, having strong and regular pains. Examination showed the ostium vaginæ patulous, the perineum soft and distensible, and the vagina large and moist. The os uteri was dilated to the size of a five-shilling piece by a large and somewhat projecting bag of membranes. The presenting part of the child was very high, and could only be reached by the intro-

duction of all the fingers of the right hand. The vertex was not to be felt through the anterior segment of the uterus. In its place, anteriorly and towards the left side, a smooth, hard body could be felt; while, posteriorly and to the right, the presenting part was soft and indistinguishable, owing to its height above the brim. As external examination showed the presence of the head just above the brim, the probability of a face presentation was recognised, but internal examination was not persisted in for fear of rupturing the membranes. I may add that the pelvis was large and roomy, that there was no unusual projection of the promontory of the sacrum, and no apparent narrowing of the conjugate diameter. Whilst making this examination, it was observed that, during a pain, the uterine tumour, instead of being smooth and even, anteriorly presented a longitudinal prominence or ridge to the left of the middle line, corresponding to the most usual position of the back of the child.

Immediately after the rupture of the membranes, it was found that the face was presenting in the right mento-posterior position. The membranes ruptured about midnight before the os was quite fully dilated. The head still remained above the brim, and did not engage for half an hour after the escape of the liquor amnii. The face then descended, and completed the dilation of the cervix. After some time it became evident that instrumental interference would be necessary, as the patient was undergoing great exertions without corresponding benefit, and the progress was extremely slow. At this time the face was in the upper part of the pelvis, just below the brim, with the chin still pointing backwards and to the right. Professor Simpson's axis-traction forceps were accordingly applied, and under their influence the head descended, and rotation of the chin forwards took place. Forceps were removed, and re-applied, and the head was delivered in the ordinary way.

After the delivery of the head no further rotation took place, either in the direction of restitution or continuous rotation; and the shoulders were accordingly born as nearly as possible in the transverse diameter of the pelvic outlet—the perineum and ostium vaginæ being distended apparently to their full capacity. This distension was due to the shoulders being unusually squared, and this in its turn was due to the fact that both arms of the fœtus were *extended straight down the back*—the elbows being close together near the middle line, and the fists of the child resting on its sacrum. The child, a large male, was born alive. The amount of force required for the delivery of the head was greater than I anticipated, considering that axis-traction forceps were used, but this was fully accounted for by the position of the arms. Had the state of the maternal passages not been entirely favourable, the child must have been born dead.

At my visit later in the day, mother and child were both well, but the latter presented the following peculiarities:—1. An un-

usual fulness in the lower part of the neck, apparently caused by an enlargement of the thyroid, and possibly also of the thymus glands. 2. A peculiar carriage of the head, consisting in a marked extension—the result of which was to separate the chin as far as possible from the sternum, and to bring the occiput into the nape of the neck—to reproduce, in fact, the attitude which the head must have assumed during its passage through the pelvis. This took place every time the child was raised or laid upon its side, and even when placed on its back there was a strong tendency to extension. The head exhibited the usual moulding after a face presentation.

Remarks.—This case appears to me to be of interest, partly because of the unusual attitude of the fœtus and its effect on the mechanism and progress of the case, and partly because it combines in itself some of the principal peculiarities of two face cases already communicated to the Edinburgh Obstetrical Society—one by Dr Halliday Croom, and the other by Dr Milne Murray.

In Dr Croom's case, which occurred at the Maternity Hospital, the face presentation was primary, and was diagnosed several days before the onset of labour. Moreover, after delivery the head of the child remained extended for several days, as in the case above described. As Dr Croom pointed out to the students, it was a face case at least a week before, and remained a face case for a week after delivery. In the case of Mrs N., I am inclined to think that the face presentation was primary, and not produced after the onset of labour by the hitching of the occiput at the brim of the pelvis and the consequent descent of the sinciput; although, as Mrs N. was not examined before labour, I have no positive proof.

My reasons for my opinion are the following:—In the first place, the height of the head above the brim during the early part of this labour, when the absence of a vertex presentation was diagnosed, and even after the rupture of the membranes, when the presence of the face presentation was ascertained, seems to preclude the idea of the occiput hitching at the brim. Secondly, the ordinary causes of face presentation were absent in this case. Flattening of the pelvis was excluded by three previous normal labours, and by direct examination of the pelvis: there was no lateral obliquity of the uterus: there was no marked dolicho-cephaly on the part of the child. Thirdly, the peculiar attitude of the head for several days after birth seems to argue a causation independent of the action of the labour. The two most likely causes seem to me to be—1. The enlargement of the glands at the root of the neck in front preventing the proper flexion of the chin upon the sternum; and 2. A spasmodic action of the posterior cervical muscles, as in the case recorded by Dr Croom.

In Dr Milne Murray's case, which occurred in his dispensary practice, there was the unusual dorsal position of the arms, and there was still greater difficulty in delivery, which was finally

effected by means of axis-traction forceps. The position of the arms in the case of Mrs N.'s child was absolutely identical with that in Dr Murray's case, as shown in the drawings exhibited by him to the Society. This position or attitude, like that of the head, seems to have been primary, as the arms in such a position exactly corresponded with the longitudinal ridge felt on the anterior aspect of the uterus during a pain. The excessive fœtal movements may have had some connexion with this position, either in the direction of cause or effect.

With regard to the management of the case,—that was left to nature until it became apparent that her efforts were insufficient to effect delivery. If I remember rightly, the action of Dr Murray was criticised by some of the Fellows of the Society, who suggested that he should have employed turning instead of the forceps. In the case of Mrs N., turning would have been perfectly easy, owing to the relaxed state of the passages and the height of the head; but having regard to the position of the arms, I think possibly the fœtus and myself have some cause for congratulation that the forceps were used instead.

With regard to the ultimate progress of the case,—on the ninth day both mother and child were perfectly well. The fulness of the thyroid was very much diminished, and the star-gazing attitude of the head was only slightly and occasionally manifested.

Dr Peter Young thought that this case was undoubtedly one of a primary presentation of the face. The cause was not quite obvious. Sir J. Y. Simpson and Dr Keiller had described cases in which enlargement of the thyroid gland was the cause. He thought that in this, as in all face cases, the proper treatment would have been turning. The peculiar position of the arms was not, in his opinion, a contraindication, as they would have gone up over the head, as in an ordinary case. Dr Hewetson was, however, to be congratulated on the successful result of his treatment.

Dr Wilson had had no face cases in which interference was necessary. He agreed with Dr Young that turning was to be preferred to forceps.

Dr Angus Macdonald had seen only few cases in which he required to interfere. Face cases were extremely rare, and all of those which he had observed terminated naturally. He thought that the essential principle to guide the obstetrician in his mode of interference was the character of the pelvis; if the pelvis be roomy, let the case alone; if it be rickety, then turn.

Dr Underhill said that the Society must congratulate Dr Hewetson on this his first paper. The difficulty in the case was entirely due to the position of the arms. He thought that the prominence of the thyroid which had been referred to might be a result, and not the cause of the position of the arms. In an umbilical hernia a similar backward displacement of the legs was sometimes present.

III. HOW SIMS' SPECULUM OUGHT TO BE HELD.

By Skene Keith, M.B., F.R.C.S.E.

Dr Sims has described in his book on *Uterine Surgery* the position in which the patient ought to be placed when his speculum is used, and his directions are usually reproduced in works on diseases of women. Scarcely anyone has thought it worth while to give the assistant any instructions about how he is to hold this speculum, and a few even appear to allow that it may be held by the gynecologist himself. Dr Sims says that the assistant "holds it firmly in the desired position," and this is about as much information as is given in most works. One or two writers advise that traction be made to the right of the coccyx, so as to raise the upper buttock. The assistant is usually told to hold the speculum by the centre, and draw back the perinæum; very much fuller directions ought to be given, not only for his own but also for the operator's convenience.

In the Women's Hospital, New York, Sims' speculum is held in this way by a nurse, who has been in the habit of holding it at all the operations there for years, and she holds it better and longer than most people will do who hold it by the centre. For one winter I scarcely ever missed an operation there; and whenever the speculum had to be held for a long time, say three-quarters of an hour or longer, I observed that this nurse would occasionally take advantage of any chance to stretch her fingers.

The objections to this way of holding it are that most assistants will soon require to have a rest and stretch their fingers, and often do so when they are most wished to keep the whole of the vagina well in view. There is also a constant tendency to project forwards the tip of that blade which is inside the vagina so much that even the cervix uteri may be hid from view.

Before coming to the consideration of how the speculum ought to be held, we must first arrange who is to hold it. An intelligent nurse, able to follow the steps of an operation, is much the best person to employ. It will usually be found that a doctor or a student is the worst, for either of them wishes to see how the operation is getting on, and every time he looks into the vagina he allows the speculum to go forwards, and then most likely gets his head in front of the operator. The nurse must stand at the patient's back, but much nearer the operator's end of the table than she is usually told to do. She must not grasp the speculum by the central part, but by the external blade, the fingers coming round the convex part and the thumb fitting naturally into the concavity at the bend. She must not be told to draw the perinæum backwards and upwards, *i.e.*, towards the patient's head, but

to pull backwards and slightly downwards away from the patient's head, steadily, and without the very slightest jerk. By traction in this direction the pelvic floor is opened up exactly in the way in which Dr Hart has described that it is done in labour. This method of holding Sims' speculum and of opening up the pelvic floor was shown to me by Professor Skene, of Brooklyn, before I had read this explanation of how the perinæum acts during parturition. If the child's head is able to gain most room for itself by opening up the pelvic structures in this manner, it is at least probable that we shall be able to gain most room for operating by imitating the natural process as nearly as we can. The nurse's elbow must be kept close in to her side. Whenever possible the table should be of such a height that it will allow of the elbow being a few inches higher than the orifice of the vagina. This arrangement allows of direct traction—the nurse's forearm and the central or connecting part of the speculum being in one line.

The reason for objecting to the speculum being employed to raise up the right buttock is, that during an operation on the cervix uteri no one ought to wish the speculum to be held exactly in the same place all the time, unless one is using a specially large one. The nurse ought to be able to follow the steps of the operation, and when the operator is at work, either on the lower or on the upper side of the cervix, she should, without having to be told, turn the speculum slightly, so as to keep the orifice of the vagina well out of the way. Very slight change in position is all that is required, so slight, in fact, that it is not every assistant who can appreciate the advantage to be gained. I have held Sims' speculum in this way for fully an hour without feeling the fingers of my right hand cramped or tired in the slightest degree. To do this you must hold the speculum by the outside blade, not by the centre, you must keep your elbow close to your side, and you must have the patient so arranged that your elbow is on the same level—or a few inches higher than the orifice of the vagina. The advantages gained for the operator are—that the nurse can more easily move the internal blade while she at the same time holds the instrument more steadily; and that the upper part of the vagina is opened up as fully as it can be, and the perinæum with the speculum is kept best out of the way. Some people seem to think that the first thing to do after exposing the cervix uteri is to fix a tenaculum into it and draw the uterus down. This cannot be safe whenever there is the slightest inflammatory state in the pelvis, and more than this, it is useless certainly when operating. Every one knows that the upper part of the vagina is the largest and the orifice the narrowest portion. Sims' speculum takes advantage of this condition, yet in spite of this fact, operations are often performed on the cervix uteri after it has been pulled down to the narrowest and most inconvenient part to which it can possibly be dragged. With instruments, whose handles are long enough, it is

much more easy to operate on the cervix at the upper part of the vagina than after it has been drawn to the vulva.

Dr Angus Macdonald thought that this paper was of great practical value, as it was undoubtedly difficult to have the speculum held in a satisfactory manner. He would have liked that Dr Skene Keith had referred to the mode of introducing it, which was also a point of importance. A self-retaining form of this speculum was a desideratum.

Dr Barbour found Sims' speculum rather long in the blade, and that sometimes the best view was obtained when the blade was not pushed into the handle. He thought it was an advantage to hold the speculum obliquely with regard to the raphe of the perineum, so as to keep up the upper labium with it.

Dr Underhill thought that matters of practical detail such as were brought forward in this paper were of great importance. He agreed with what was said as to the desirability of not pulling down the cervix.

Dr Skene Keith, in reply, said that he thought this matter of holding the speculum was of some little importance; he had not referred to the mode of introducing it as it did not belong to this question. No self-retaining speculum could be contrived, as it could not be fixed to the patient's person, and when fixed to the couch was displaced on the slightest movement of the patient. He did not agree with what Dr Barbour had said; the speculum should be drawn straight back, not obliquely.

IV. SOME PRACTICAL POINTS WITH REGARD TO THE MEMBRANES IN THE THIRD STAGE OF LABOUR.

By A. H. Freeland Barbour, M.D., F.R.C.P. Ed., Assistant to the Professor of Midwifery and the Diseases of Women.

Scientific treatment must rest on an anatomical basis. The more accurate and precise our knowledge of anatomy is, the more definite will our principles of treatment be. In this paper we shall consider some practical points with regard to the membranes in the third stage, based on the anatomical facts brought forward in a former paper.[1]

Before doing so let us glance briefly at the changes which occur during labour in the anatomical relations of the membranes. At the end of pregnancy we have the uterine cavity lined with the membranes in the following order, from without inwards:— Decidua, chorion and amnion containing the liquor amnii, and fœtus. To facilitate description we give some rough diagrams, but it must

[1] "The Anatomy and Relations of the Uterus during the Third Stage of Labour and the First Days of the Puerperium," *Edinburgh Medical Journal*, September and October 1884.

be remembered that these are only intended to make our meaning clear; for anatomical facts we must refer to the plates in the paper already mentioned. Fig. 1 shows the general relations of the membranes to the uterine cavity and to the placenta before labour has begun. Most external is the muscular wall; resting immediately on it is the decidua; within this is the chorion, and finally the amnion distended by the liquor amnii. On one part of the wall the chorion and decidua blend in the placenta. The minute structure of these layers is indicated in Fig. 2. The amnion consists of a single layer of columnar epithelial cells resting on a delicate connective tissue, which unites it to the chorion. The chorion is composed of a band of compressed fibrillated tissue below which is a more cellular layer. The decidua consists of the vera and reflexa, which have become practically one membrane. It appears as if made up of two zones—a superficial compact and a deeper spongy zone. The appearance of two zones or layers in it is due to the changes which the glands of the uterine mucous membrane undergo during pregnancy. The ducts of the gland become obliterated by pressure, and hence the membrane has a compact appearance above; the lower portions of them hypertrophy, and appear as epithelium-lined spaces in the decidua, giving it a spongy appearance on section.

So much for the relation of the membranes before labour has begun. What are the changes which occur during labour? Or the question might be thus stated: Here is a bag containing water (for we may leave the fœtus out of account); the wall of this bag consists of several layers; what will happen if you tap the bag? how will these layers behave? Their behaviour will depend on the nature of the layer itself, and of its union with the adjacent layers. With regard to the nature of the individual layers, the amnion is the thinnest, strongest, and most elastic of the three membranes; the chorion is thicker, but not so strong; the decidua, although the thickest, is friable and without much cohesion between its parts. The muscular wall possesses contractility. As regards their union, the amnion is united to the chorion by a delicate, gelatinous connective tissue, which forms a plane of weakness in the cohesion of the membranes, indicated by the dotted line *m* in Fig. 2; the chorion is intimately united to the decidua, being first rooted in it by the primitive villi, after which the two membranes become so blended that it is difficult to trace a line of demarcation under the microscope; the decidua is united to the muscular wall just as the mucous membrane of the unimpregnated uterus is, there being no muscularis mucosæ. The peculiar development of the glands produces a plane of weakness in the spongy portion of the decidua indicated by the line *n* in Fig. 2. The persistence of these glands in the deepest part of the decidua throughout pregnancy, and the fact that this line of weakness runs so as to leave after delivery a layer of the decidua with portions of

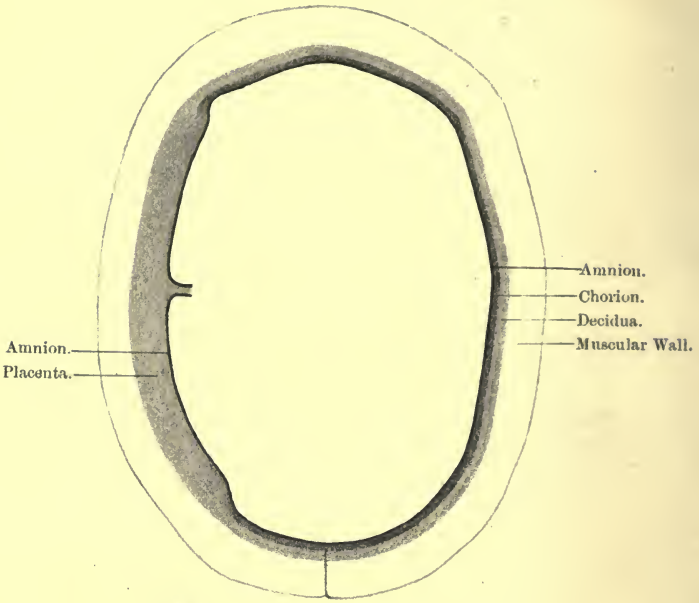


Fig. 1.

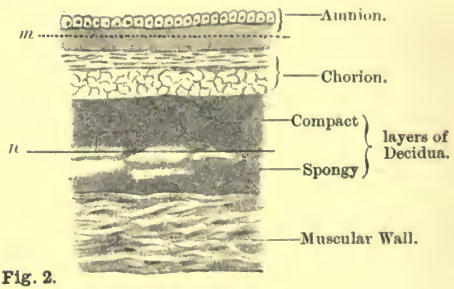


Fig. 2.

RELATION OF MEMBRANES TO UTERINE WALL: at end of Pregnancy, Figs. 1 and 2 (diagram

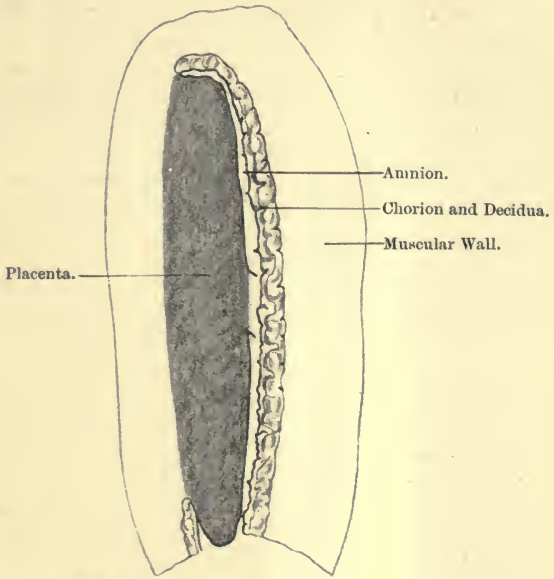


Fig. 3.

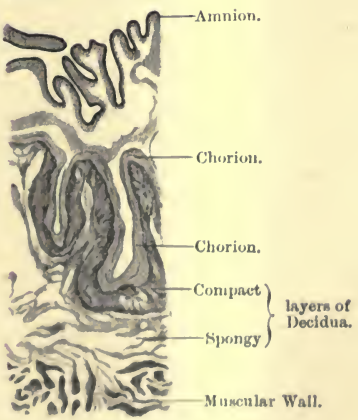


Fig. 4.

at end of second Stage of Labour, Figs. 3 and 4 (based on anatomical preparations).

the spaces lining the muscular wall, are significant with regard to the regeneration of the mucous membrane. These spaces serve as storehouses of epithelium (for we cannot attribute any secreting function to them during gestation), from which the epithelium is developed in the puerperium to line the interior of the uterus.

The condition after the bag is tapped and its contents withdrawn is shown in Fig. 3 and Fig. 4. The muscular wall contracts and becomes, of course, thicker. The decidua and chorion behave practically as one membrane, and are thrown into a series of more or less regular wavy folds, and become detached at the crests of the waves from the uterine wall, the separation taking place in the spongy layer, *i.e.*, along the line of weakness *n* in Fig. 2. The amnion separates itself from the chorion along the line *m*, and throws itself into smaller papillary folds. The placenta does not separate from the uterine wall.

The partial separation of the decidua and chorion is evidently due to the diminution in area of the inner surface of the uterine wall; the muscular wall contracts, and the membranes, not possessing contractility, are crumpled up. The separation of the amnion from the chorion can, I think, only be explained by a difference in elasticity between the membranes. The plane of separation of the amnion and chorion is indicated by a dotted line, because it is not of great practical importance, and I do not know whether it is a constant occurrence. As the folds are microscopic, they might quite well be present when these membranes come away, apparently in contact throughout. The important plane of separation is indicated by the line *n*. All above this line should come away in a case of normal labour; that below it remains to produce the new mucous membrane. Why the placenta does not separate is not evident. In Braune's plates and in specimens in the Obstetrical Museum I have been struck with the thinness of the placenta while *in situ* during pregnancy. Its spongy texture may allow of its site diminishing without its sliding off.

The foregoing anatomical facts are of great practical importance. As we follow them out we find them branching in various directions; and keeping hold of them, we have a clue to a great many clinical facts. In this paper we shall refer to three of them.

1. With regard to *the retention of portions of membranes in the third stage.* They show us the value of examining carefully the membranes as well as the placenta after delivery. While the importance of examining the placenta is fully recognised, the examination of the membranes has not received the attention it deserves. And this for two reasons. The danger of the retention of a portion of placenta in producing post-partum hæmorrhage and septicæmia is an ascertained fact; while the relation of retention of portions of membranes to endometritis is not generally recognised, although Küstner's investigations give us an anatomical basis for it. A more obvious reason is that in studying the expelled

membranes by themselves we were reading a book torn through the middle, which was unintelligible, not to say uninteresting; but in the series of preparations described in my former paper, we have the book complete, which tells its story in a lucid and suggestive manner.

In examining the membranes we might proceed as follows,—(*a.*) Note the seat of rupture (as indicating the situation of the placenta in the uterus), and whether the amnion and chorion have ruptured at the same point. It would be interesting to know whether with a central rupture of the membranes, *i.e.*, with an equal length of membranes all round the placenta, pointing to a fundal insertion, there was a retro-uterine hæmatoma as suggested in my former paper. (*b.*) Examine carefully round the tear in the amnion to see whether all the chorion is present; when the two membranes have been delivered in contact with each other we can easily detect a deficiency of the chorion. (*c.*) Notice also whether the chorion is present over all the rest of the amnion, and whether the decidua is of uniform thickness throughout. The decidua appears as a pale-red areolar tissue of a dull lustre, which contrasts with the glistening chorion. The best way to tell its thickness is to hold the chorion up to the light, or to scrape off the decidua with the finger nail.

I said that we should examine the membranes, specially round the seat of rupture, to see whether the chorion was present, because in three cases in which I have found the membranes adherent they felt as if they were adherent in the lower part of the uterus. In a fourth case I could demonstrate this conclusively. It was a case of labour in a patient with a sub-peritoneal fibroid of the uterus, whom I saw along with Dr Craig. We expressed the placenta by Credé's method about ten minutes after the birth of the child. The membranes were retained, and, on being twisted up, tore through just at the os. I passed my fingers into the uterus and detached carefully what was retained. It was a piece of chorion with decidua, about six inches square, and showing in its centre a rent representing the rupture at the os.

But some one will say, Supposing I find that a portion of decidua is absent, you would not have me pass the hand into the uterus to remove it. Certainly not, because in averting the probability of endometritis you might expose the patient to the risk of introducing septic matter into the uterus, and after the membranes are torn through you lose the guide to the adherent portion. A routine practice of systematic and careful examination of the membranes will, however, have these good results: it will lead us in the first instance to take more care in the delivery of the membranes; it will also influence our prognosis as to the ultimate return of the interior of the uterus to a healthy condition.

2. With regard to *the mode of delivery of the membranes,* in the management of the third stage, the following points are of

practical importance. As the membranes are only gradually separated, the placenta should not be expressed immediately after the birth of the child, but after an interval of about half an hour. When it is expressed out of the uterus it may be arrested by its own bulk in the cervix or vagina. The lax and folded condition of the cervix (*v.* Plate V. in the paper referred to) favours its arrest here, and the fact that the vagina at once returns to its normal direction of being parallel to the pelvic brim and at an angle with the uterine axis (*v.* same Plate) explains its arrest here. Supra-pubic palpation will tell us whether the placenta has left the uterus. If it be arrested in the vagina, it will slip out on hooking back the perineum; if in the cervix, we should lay the hand, not on the fundus uteri as in the Credé method, but on the lower uterine segment (in which we can generally feel the placenta lying), and express the placenta. But the arrest may be due to retention of the membranes, and here more care is required. The ordinary method of twisting them into a rope is a good procedure, provided we at the same time pass the fingers into the vagina to make sure that this twisting does not make them tear through outside the cervix. If we feel that they are tearing through it is best to run the finger along the membranes into the uterus and detach them with the nail. The advantage of this procedure was forcibly impressed on me by a recent case of retained placenta. After detaching a corner where it was adherent, it glided into the vagina, but was arrested at the vulva. The cause of its arrest was the membranes, and as I had already passed my hand into the uterus, I did so a second time without twisting them into a rope; I ran my finger along them to the fundus, and felt in one Fallopian tube angle of the uterus a body the size of a small walnut, which I detached carefully. It was a succenturiate placenta—placed 5 inches from the main placental mass—and the least force would have torn through the delicate chorion and left this inside the uterus.

3. With regard to the *cause of the hæmorrhage in partial placenta prævia*, the plane of weakness between the amnion and chorion is of interest. Schrœder explains the separation of the placenta to be due to the fact that the placenta is kept taut, as it were, on the unruptured bag of the amnion. Hence, as the uterine wall retracts off the ovum, the placental site must be stripped off the placenta, and hæmorrhage occurs; if you rupture the membranes, you allow the placenta to retract with the uterine wall, and there is no hæmorrhage. A study of these preparations made me doubt these facts, because—(1) the chorion is a delicate membrane and tears readily; and (2) the connexion between the amnion and chorion is of such a slight nature that the difference in their elasticity is sufficient to separate them. A recent case of delayed rupture of the membranes allowed me to study this clinically. The bag of membranes did not rupture when the os was dilated, but came down and distended the vulva. As I could now see that this bag

was formed of chorion and decidua, as well as presumably of amnion, I kept it entire until it formed a tumour the size of a fœtal head outside the vulva; as soon as the child's head slipped into this sac, I divided the latter carefully, and slipped it over the shoulders and body of the child.

My reason for preserving the bag of membranes after I saw their nature was to find out whether the chorion would follow the amniotic sac as it moved downwards, or whether it would tear, and leaving a cap on the lower pole of the ovum, become separated from the rest of the amnion. The latter was the condition found. We do not see, therefore, how Schrœder's explanation of the separation of the placenta in placenta prævia is supported, and prefer that of Matthews Duncan, who attributes it to the change in shape of the lower uterine segment.

Dr James Ritchie said that it was not evident why the placenta did not separate as well as the rest of the decidua.

Dr Peter Young thought that Dr Matthews Duncan's description of the mode of the delivery of the placenta was now generally accepted, and that Dr Barbour's explanation of how this occurred was satisfactory. He thought, however, that Schultze's description might hold for exceptional cases when there was atony of one portion of the uterine wall; he had satisfied himself of its occurrence in some cases in which the placenta was undoubtedly attached to one wall of the uterus, and not to the fundus. Succenturiate placentæ were, in his experience, more common than was generally held, and they usually came away easily.

Dr Angus Macdonald had listened with great pleasure to this accurate, interesting, and scientific description of the relation of the membranes, and the method of their separation. The most original part of the paper was that which dealt with the separation of the placenta, as it upset all our previous notions on this subject. He doubted whether the attachment of the placenta to the uterus was so strong as this implied. The part of the paper which dwelt on the great importance of examining the membranes carefully was quite right, and above praise. Ahlfeld had shown how infection from without had been reduced to a minimum; but there was a source of infection from within which cannot be guarded against; and through ignorance as to this, obstetricians were often blamed for results which lay largely beyond their control. These bad results would only be guarded against by great care in the management of the third stage. He agreed with Dr Barbour that we should not be in too great a hurry; undue hastening of this stage leads to hæmorrhage, which would not occur if the uterus were allowed time to rest. There was one small point not referred to in the paper, viz., that in pulling on the membranes, the traction should be in the direction of the axis of the uterus.

Dr Underhill referred to the importance of having precise

anatomical detail as the basis for practice. It is only by papers such as this that we get the accurate ideas which should guide our practice. There were two points which this paper did not take account of: The difference in the shape of the uterus during the third stage in different cases, which would affect the separation of the placenta, and the fact that there was often bleeding before the placenta came away.

Dr Freeland Barbour, in reply, explained that the foldings of the amnion were so minute as to be recognised only by the microscope. It was a common occurrence for the amnion and chorion to come away apparently adherent throughout, but these minute folds might be present in that case also. This separation of the amnion and chorion was not of great practical importance, except as showing that the adhesion between these membranes was so slight that the difference in their elasticity was sufficient to separate them. The separation of chorion along with the decidua through the spongy layer of the latter was, however, of great practical interest. Although the folds were visible to the naked eye, the separation was only partial, and the lacunæ thus produced microscopic. Why the placenta did not separate he was unable to say, but there was no doubt that it was not separated in the preparations he had described; this was the fact which had struck him most forcibly in these specimens, and it was borne out by the examination of others; it was one of great practical importance.

MEETING VI.—MARCH 25, 1885.

DR DAVID WILSON *in the Chair.*

I. *Dr Foulis* showed (1.) a SECTION OF THE OVARY OF A RABBIT. In the field of the microscope five ripe Graafian follicles with their contained ova were seen. (2.) A SECTION OF THE WALL OF A YOUNG OVARIAN CYST. In this preparation the cylindrical epithelium lining the cyst cavity was beautifully seen. Dr Foulis pointed out that the cells of epithelial lining of all young ovarian cysts are, at first, cylindrical or columnar in form, though as the cyst enlarged these epithelial cells greatly altered in form. In almost every young ovarian cyst certain of these columnar cells could be seen giving forth at their free ends small, almost spherical drops of colloid matter. In the preparation before the Society, numerous epithelial cells were seen, from the free ends of which such colourless globules were being shed. These little solid colloid bodies fell into the cavity of the cyst, and rapidly underwent fatty degeneration, and, as Dr Foulis believes, become ultimately the well-known ovarian granule cells of Drysdale.

Dr Foulis holds the opinion that the ovarian granule cell is neither a nucleus nor a cell, but is a little, solid, spherical, or oval mass of colloid matter shed from the free ends of the columnar epithelial cells of all young ovarian cysts.

II. TEN CASES OF LAPAROTOMY PERFORMED IN THE ROYAL INFIRMARY, FROM MAY TO NOVEMBER 1884; WITH REMARKS.

By Angus Macdonald, M.D., F.R.C.P. Ed., F.R.S.E., Physician and Clinical Lecturer on the Diseases of Women, Royal Infirmary; Lecturer on Midwifery and Diseases of Women and Children, Medical School, Edinburgh.

In presenting the following report of ten cases of laparotomy as an instalment of the work done in Ward XXVIII. during the six months from May to November 1884, I feel that I should preface it, not, perhaps, with an apology, but with a word or two of explanation. This apology or explanation has reference to the length to which the reports, with observations upon them, have attained in my hands. Even though every point not necessary to a due appreciation of the nature of the cases and the operations has, I think, been excluded, there yet remains the incontrovertible fact that the paper is rather long.

My sole reason for laying the cases in this form before you is the profound conviction that otherwise the work had better been left undone. But the Society expressed a desire to have such reports, and that of the preceding half year was received with considerable favour. In a certain number of reports of operative gynæcology there is a great want of detail in stating the difficulties encountered and the way in which these were met. The more common plan is to content one's self with a word or two of history, a statement of the diagnosis and treatment, with the results. It is perhaps vaguely stated that great difficulty was experienced in doing something that had to be done, but that the operator, after some time, triumphed over these obstructions. Now, I hold if such reports are to be useful to the Society or to the profession at large, and not merely something to excite their curiosity or astonish them, some pains must be taken to include the grounds on which the diagnosis is founded, as well as the difficulties which were met with and the methods by which these were overcome. Wearisome collocation of irrelevant facts are, however, equally to be avoided as excessive brevity. Accordingly the Fellows will notice that in this report every effort has been made to exclude data that do not bear in an important manner upon either the diagnosis or the treatment.

With these preliminary remarks I proceed to the consideration of the cases. These consist of—I. Five cases of ovariotomy. II. One case of removal of a broad ligament cyst. III. One case of

removal of a sero-sanguineous cyst of the peritoneum, possibly mesenteric. IV. Three cases of removal of the uterine appendages.

I. *Laparotomy for Removal of Ovarian Tumours.*

CASE I.—Mrs D., æt. 52, residing in Selkirk, recommended by Dr Thomas, was admitted on 17th June 1884, complaining of swelling of abdomen. Patient ceased to menstruate about seven years ago. Seven months ago patient first felt a hard lump in the left iliac region, which caused her great pain. A blister removed the pain, but the swelling increased, and her doctor advised her to go to the Infirmary.

Physical Examination.—Abdomen is greatly distended with a swelling considerably greater than a full-time pregnancy. The tumour is globular in shape. When the patient is lying on her back the lower portion of the right side of her abdomen is pendulous. The tumour has a soft elastic feeling over the greater part of it, though in limited areas there is a feeling of hardness. Tumour moves slightly with deep inspiration. Fluid thrill and fluctuation distinctly felt. Dulness on percussion all over the abdomen, except in the flanks and immediately below the ensiform cartilage. Resonance in the right flank is only heard when percussed far back. Greatest girth of tumour, 2 inches below umbilicus, is 44 inches.

Treatment.—Ovariotomy was performed on 28th June. When the peritoneum was reached, it was found absolutely adherent to the tumour in front. In endeavouring to raise the peritoneum from the surface of the tumour the latter was wounded. This necessitated tapping immediately, and before the incision was completed. After running off as much as the large aspirator would draw, the latter was withdrawn, and the opening in the tumour having been secured with forceps, the adhesions were examined, and the upper edge of them ascertained. The adhesions were now peeled off the tumour in all directions as far as could be reached, and the incision enlarged so as to admit the hand into the peritoneum. It was then found that with the exception of a few inconsiderable omental adhesions the tumour was free, except at the lower anterior aspects. The remaining adhesions were now carefully separated all over the lower aspect of the tumour, nothing occurring that seemed to require tying.

The omental adhesions were tied, and sponges were now inserted round the incision and the tumour emptied as far as possible. A large semi-solid mass on the right posterior aspect of the tumour gave some trouble on account of the tenacity of its contents. The pedicle, which was a broad one, and very thick on its inner aspect, was found to be connected with the right broad ligament. There was no disease of the left ovary. The pedicle was secured by three silk ligatures. Hæmorrhage from the stump was completely arrested. The abdomen was thoroughly cleansed, the pedicle

dropped, and the abdominal wound brought together by deep and superficial stitches. Operation lasted 65 minutes. Tumour weighed 40 lbs. 2 oz.

Patient passed wind on the third day, bowels were moved on the sixth day, and the deep stitches were taken out on the seventh day after operation. Eight days after operation the right parotid gland became intensely swollen, and remained so for about a fortnight; otherwise the patient's recovery was uninterrupted. Discharged 9th August in good health.

There is little to remark regarding this case, except that the adhesions, which were pretty general in front, rendered the removal of the sac a matter of considerable difficulty. Those to the parietal surface of the abdomen were, though general, very little vascular and comparatively unimportant, had it not been for their position. But as they were situated in the line of the abdominal incision, they caused a considerable amount of trouble, and made the operation rather difficult until their extent and nature were defined by enlarging the incision. Those to the omentum were more serious, and required, of course, to be carefully ligatured.

Another point of more importance is the occurrence of parotitis. Considering the connexion, allowed on all hands to exist, between mumps and ovaritis in the female and orchitis in the male, it is not too much to expect that the sympathetic chain could work backwards, and that irritation of the ovarian nerves should produce inflammation of the parotid. I am inclined to this view the more that this is the second time I have met with parotitis after the operation of ovariotomy.

In neither of these cases was there temperature or other symptoms to lend the least colour to the opinion that the parotid inflammation was septic. In neither case did the glands suppurate. The parotitis merely complicated the convalescence a little by the pain and concomitant slight degree of fever it induced. The fever never ran over 101°.

On the occasion of my first case of parotitis I consulted Dr Thomas Keith as to whether his experience tended in that way. But he told me that he had only met it twice, and seeing that it had occurred only that number of times among five hundred operative cases, he was not inclined to regard the connexion as otherwise than what might be expected to happen in a similar number of serious surgical operations. He was kind enough to send me notes of one of his cases. That one, however, was doubtless a septic case, and evidently could not be used in support of any theory of reflex sympathy such as I am inclined to urge.

I am interested, however, to note in No. 47 *Centralblatt für Gynäkologie*, 1884, a case of operation, after the bursting of a cyst by Küster, which was followed by parotitis. In this case there was, however, an abscess of the abdominal wall, which formed in the track of one of the stitches.

Altogether, I am inclined to think that the occurrence of these parotitic inflammations is worthy of being noted, as they fall in with well-known facts in connexion with reverse sympathies.

CASE II.—M. W., æt. 57, residing at Musselburgh, was admitted 3rd July 1884, complaining of a swelling in her abdomen. Patient is unmarried, and has had no children. Menopause occurred eight years ago. The swelling was first noticed two years ago, commencing in the right groin and gradually extending upwards over abdomen.

Physical Examination.—Abdomen distended to size of full-time pregnancy. Right side fully more than left. Greatest girth, at level of umbilicus, is 36 inches. Tumour has a uniformly smooth feel. Fluctuation and fluid thrill is felt freely through it. Percussion in the mesial line is absolutely dull till about 1½ inches below ensiform cartilage, where it becomes resonant. Percussion note on left side is clear along a thin line parallel to the iliac crest and Poupart's ligament till about 2½ inches from the upper edge of the symphysis pubis, where it becomes flat. Left flank resonant. Deep behind in right flank note is clear, otherwise on right side dull. Position of percussion note not appreciably altered by change in position of patient.

P. V.—Hymen persistent and tight. Uterus deeply placed in pelvis, small, and movable. Tumour can be felt occupying inlet, but no part of it is fixed in pelvis.

Treatment.—Ovariotomy was performed. Some loose adhesions over anterior surface of tumour were divided by a sweep of the hand. The tumour was attached by a thin pedicle to the right broad ligament. After being lessened by tapping, it was drawn through the opening, and the pedicle tied in a Staffordshire knot, the tumour removed with scissors, and the pedicle dropped. The abdomen was now sponged clean, and the wound brought together by seven deep and numerous superficial stitches. The operation lasted twenty-eight minutes. The tumour was connected with the right broad ligament. The left ovary was very small, but apparently healthy. Patient made an excellent recovery. Dismissed 12th August.

The above represents an easy ovariotomy operation, whose history was as uneventful and successful as we could well wish.

CASE III.—Mrs B., æt. 44, residing in Midcalder, recommended by Dr Wilson, was admitted 1st September 1884, complaining of a pain in her right side and of a swelling which occupies her abdomen. Present attack gave no trouble till last February, when patient's attention was attracted by slight uneasiness and swelling of her abdomen, both, she thought, to be due to pregnancy, in spite of the facts that menstruation was regular and the mammæ unchanged.

Physical Examination.—Greatest girth of abdomen, 39 inches. Free fluid thrill felt throughout the abdomen. Percussion dull in the flanks; a sense of increased resistance in the lower anterior part of the abdomen. The uterus was low down in the pelvis, but no definite tumour could be made out per vaginam. Sound entered 2½ inches upwards and to the left. On aspirating, the aspirator was found to enter the cavity of a large tumour, but only a drop or two of gelatinous stuff was obtained with the strongest aspiration. An attempt was made to facilitate the passing of the free fluid from the abdomen by pressing in the sides whilst the trocar was being partially withdrawn, but nothing could be obtained further. The conclusion formed was, that we had to deal with a burst ovarian cyst with very gelatinous contents.

Treatment.—The operation of ovariotomy was performed on 10th September. On opening the peritoneum a large quantity of stringy jelly-like stuff issued forth. After as much of this as possible was removed, an examination was made of the tumour, which was found to spring from the right broad ligament. The left ovary was normal. The tumour was now tapped, but scarcely anything could pass through the large aspirator. An incision was now made in the tumour, when it was found to be filled with thick gelatinous stringy stuff of great tenacity. This had to be pulled out in ropy masses, and ultimately the tumour was ligatured and removed. Extreme difficulty was experienced in cleansing the abdomen, from the adhesive gelatinous stuff with which it was filled; and after great trouble this was only imperfectly accomplished. The wound was secured in the usual fashion. A glass drainage-tube was inserted into its lower angle, but removed after four hours, and a superficial stitch passed in its place. The patient rallied well from the operation. The tumour with contents weighed 20 lbs. Patient made an uninterrupted recovery, and was dismissed on 3rd October, all evidence of abdominal fluid having disappeared.

There was a distinct rounded perforation in the upper part of the tumour, through which the gelatinous stuff had escaped into the abdomen. There was also observed a kind of roughening and thickening of the parietal peritoneum, as well as some extra reddening of the visceral peritoneum. There was also noticed a peculiar oblong thick walled cyst, about 2½ inches long by ¾ of an inch in diameter, attached by a sort of mesentery to a portion of intestine on the right side. As this structure appeared so very like a distended condition of the caput cæcum coli, it was deemed unadvisable to remove it. This case is so very like the one that follows it, that I prefer to record the latter before making my observations on some points of special interest connected with the tumours.

Case IV. — Mrs D., æt. 58, residing in Falkirk. Ad-

mitted 9th October 1884, complaining of a swelling of the abdomen, and a tumour which protrudes through the vagina. About a year before admission the patient first noticed a swelling immediately above the pubis. This gradually became larger, and grew up the abdomen in the middle line till it reached the pit of the stomach. Lately it seems to have fallen from its greatest height. It greatly distended the abdomen, and prevented her from doing work; and for last six months she has been lying on her back a good deal. About six months ago she suffered from diarrhœa, and a swelling came down from her vagina.

Physical Examination.—Abdomen distended to the size of a full-time pregnancy. The distension is more marked to the right than towards the left. Umbilicus projects. Circumference round umbilicus is 39 inches. Feeling of surface of tumour is smooth, firmer, and more irregular on right than left. No friction to be felt or heard. Tumour movable under peritoneum. Percussion dull in mesial line to 1½ inches above umbilicus, after that clear. Some resonance in the left flank, passing up to iliac fossa, where it vanishes. Some resonance far behind in the right flank, otherwise dull. When the patient is turned on the left side, the mass sinks away to the left, and gives resonance in the right groin. Fluctuation and fluid thrill both right and left, but not from right to left. *P. V.*—Large prolapse of bowel, in shape of a vaginal rectocele. Uterus displaced upwards towards the left. Tumour does not descend into the pelvis, but can be felt with difficulty high up above the brim. Sound enters upwards and forwards 2½ inches.

Operation on 21st October. On reaching the peritoneum it was opened with ease, and a large quantity of extremely gelatinous material poured forth, of deep amber colour. After the peritoneal cavity was emptied as far as possible, the hand was passed round tumour, in which there was discovered a transverse rent slightly above the upper angle of the abdominal wound. The tumour had no adhesions, and was connected by a thin and rather short pedicle to the right broad ligament. Left ovary healthy. From the extremely fibrous nature of the contents of the tumour, it was deemed useless to aspirate. Its size was diminished by its contents being pulled forth in rope-like masses, until the tumour could be drawn through the abdominal incision. Its pedicle, which was connected with the right broad ligament, was secured in a Staffordshire knot and the tumour removed. No bleeding from the pedicle. In relation to a portion of intestine on the right side, but forming no part of it, there was a dense cyst, 3 inches long by ¾ inch in diameter. The attachments of this cyst were also ligatured, and the cyst clipped off. Its end towards the bowel seemed to be blind. The extravasated contents of the tumour were cleared out with as much thoroughness as practicable, but it was impossible to completely clear the abdominal cavity. The incision was brought

together in the usual fashion, the wound dressed, and the patient put to bed.

The small tumour above described consisted of thick walls, apparently muscular, lined by a mucous membrane. It contained a clear glairy fluid. On its outer aspect there were two or three shiny cyst-like bodies. Patient recovered well from operation. She passed wind the day after. Deep stitches were removed on sixth day. Union perfect. Dismissed cured, 15th November 1884.

The above two cases present several points of special interest. It will be noticed that in both cases the cysts had ruptured without our being able to trace its occurrence to any injury. It is likewise to be observed that in both cases a peculiar ovoid intestine-looking cyst was observed. These cysts were tensely filled with fluid, and provided with thick walls, and were apparently connected directly with the intestine by a sort of mesentery. So far as I have been able to make out, the most probable explanation of them is, that they were diverticula from the small intestine, which are believed to arise in connexion with the ductus vitelli intestinalis, which unites the intestine with the umbilical vesicle in fœtal life (see Quain's *Anatomy*, seventh edition, page 841).

In dealing with the first tumour I did not care to interfere with it, as I feared it might be a dilated vermiform appendage; but as on the second occasion it did not seem to be so closely connected with the bowel I removed it, as it appeared so tense that I feared it might ultimately burst. The thickness of its walls, however, on section, indicated that that would be only a remote contingency. I have never met with them on any other occasion when operating on the abdomen. Why these two cases should have presented this peculiarity I am at a loss to understand, unless, perhaps, the escaped stringy fluid may have acted as an irritant upon them, and led to their increased growth. In favour of that idea is the fact that the wall of the one removed was undergoing a sort of gelatinous degeneration at certain points. The extreme tenacity of the contents of the tumours, and the stringy fashion in which the extravasated contents adhered to the coils of intestines, seemed to me very peculiar and unusual. It almost appeared to form a membranous meshwork round the bowels, from which at many parts it could only be removed by being peeled off.

The cases seem to be in some respect analogous to those cases described by Werth,[1] and which he will have to be allied to what Pean calls Tumeurs par Maldie Gélatineuse du Péritoine,[2] suggesting that the great French surgeon in his hurry failed to trace a connexion between the disease of the peritoneum and

[1] "Ueber Pseudo-myxoma Peritonei," *Archiv für Gynäkologie*, Bd. xxiv. s. 103.

[2] *Tumeurs de l'Abdomen et du Bassin*, Paris, 1880.

diseased ovaries, which he (Werth) believes must have existed; but if so, there was no further change in my cases in the peritoneum than some extra thickness, redness, and marked roughening.

Professor Greenfield examined the cyst in the former of these two cases, and reported as follows:—"The portion of cyst examined was very unlike a common ovarian cyst. In the thicker and older portions the structure was dense, composed of fibrous tissue, with a very large number of yellow elastic fibres and numerous bundles of unstriped muscle cells. But for the most part the structure was very highly cellular, resembling actively growing granulation tissue, exhibiting in some parts many interlacing spindle cells, in others masses of granulation cells of various shapes. Towards the free surface, *i.e.*, the surface bounding the cyst cavity, the structure resembled that of an actively granulating wound, being composed of dense masses of cells forming irregular bands, and containing numerous large irregularly dilated capillaries filled with blood. The secondary cysts appeared to be lined only by a layer of flattened cells resembling an endothelium, and not distinguishable in character from the cell masses in which they lay. In some places two or three layers of cells were present, in others the flattened cells were absent, the cell buds growing freely into the cavity."

The pathological conditions here enunciated would seem to indicate a special activity of growth, possessing characters not usual in the life history of ovarian tumours, where the separating cells are usually of the cylindrical form. Still, the history of the cases show that whatever the changes arising exactly were, the tumours with their contents were of a benign character. From the most careful exploration after the conclusion of convalescence, no evidence of fluid of any kind could be made out in the abdomen, so that it is manifest that whatever was left was in some way absorbed, however the process was effected. I mention this fact because Werth in his paper on the subject states that he believes such cases lead to peritoneal irritation on account of the insolubility of the gelatinous material, and its consequent impossibility of being absorbed by the peritoneum.

It is idle to say that I was able to empty the peritoneum in these cases. I sponged and scooped out with the hands as much as possible; but after my best endeavour, there was a considerable amount of the extravasated cyst contents left behind in the abdomen. I introduced a drainage-tube for some time in the first case; but after thinking over the impossibility of any of this gelatinous material escaping by it, I withdrew it a few hours afterwards, in case it should lead to sepsis. I am very much averse to the use of a drainage-tube in infirmary cases. If we are careful to exclude sepsis, it seems to me that it does not matter so very much what is left inside the abdominal cavity. I am therefore

careful to cleanse the abdomen from foreign fluids as completely as possible, and am equally careful when that is possible to exclude any such fluid entering the cavity. But I am most careful of all things to prevent the entrance of anything into the cavity that might excite any sepsis within it. I think also that in the Infirmary a drainage-tube has once at least led to disastrous results in my hands.

Case V.—Mrs M., æt. 52, residing at Broxburn, was admitted on 5th September, 1884, complaining of pains and swelling in her abdomen. Patient is nulliparous, and has been ailing for about 12 months, but has got worse during the last three.

Physical Examination.—Abdomen is distended in the lower part to about the size of a six months' pregnancy. Percussion is dull in the mesial line up to the umbilicus, after that resonant. Both flanks resonant. Some tenderness on pressure complained of in the left groin, where there is also a sense of increased resistance. A feeling of increased resistance is present also over the lower part of the abdomen. No distinct fluctuation is to be felt in outline of tumour. *P. V.*—Vagina short. Vaginal portion of cervix is rounded. In front of vaginal portion, and closely connected with it, are two firm slightly tender nodules communicating the feel of a fibroid tumour. The uterus is movable. The entrance into the pelvis anteriorly is blocked by a movable soft tumour whose outline appears to be smooth, but not specially tender. Sound enters upwards and forwards 2½ inches. Measurement round the most projecting part of tumour is 33 inches.

3rd October.—Since admission patient's abdomen has been increasing in size. There is dulness in both flanks and free fluctuation, indicative of free fluid in abdomen. As this was giving rise to considerable distress to-day, as well as with a view to establishing diagnosis, the patient was aspirated. A large quantity of thin, deeply straw-coloured fluid was withdrawn from the abdominal cavity, care being taken to push the fluid in the direction of the aspirator by lateral pressure in the loins. The trocar was now reintroduced into the canula, and what appeared to be a thin-walled cyst penetrated. From this a quantity of similar fluid was obtained. The fluid examined microscopically was found to be composed of blood cells mingled with groups of large rounded multinucleated sprouting cells arranged in masses. Sp. gr. = 1026. It gave a dense deposit with heat and nitric acid. Reaction alkaline. Diagnosis formed was ascites, with ovarian sarcoma. This diagnosis was also arrived at by Dr Foulis on examination of the fluid only, without knowing anything of the patient. As it was uncertain whether these malignant cell groups were derived from the peritoneum or from a cyst inside the ovary, it was resolved to operate so as to give the patient a chance.

The operation was performed on 8th October. On reaching

the peritoneum a large quantity of straw-coloured fluid escaped. It was now found that the tumour, which was chiefly solid, was connected with the right broad ligament by a very broad attachment, which, however, presented enough of a sulcus to enable a ligature to be passed close to the uterus. This was effected, and the base secured in the grasp of a Staffordshire knot. The tumour was now cut away as close to the ligature as was deemed advisable and the cut surface examined. At this stage it was found that a portion of the surface of the pedicle bled rather freely. The pedicle was now grasped afresh and transfixed with a blunt pointed needle carrying a double thread, and again tied beyond the first ligature. This produced complete arrest of hæmorrhage. The abdomen was mopped dry, and the pedicle dropped after cutting the ligatures short. It was found that on the left side of the uterus, and occupying the situation of the broad ligament and rising above the fundus slightly, there was an elastic semi-solid mass, apparently being made up of the broad ligament and ovary infiltrated with sarcomatous matter. It was deemed prudent to leave the left broad ligament alone. The abdomen was cleaned, and the wound brought together in the usual manner. The solid part of the tumour removed was found to weigh 2 lbs. The fluid evacuated (being both ascitic and fluid from the tumour) measured 7 pints. Deep stitches were removed on the sixth day after operation; wound perfectly healed. Sometimes she passed her urine involuntarily and suffered occasionally from pain, but otherwise she felt well, though weak, and was discharged 30th October 1884.

This case is of considerable interest in regard to the question of diagnosis and the relation of ovarian fluid thereto. Combining clinical and microscopic examination we had no difficulty in arriving at a true conclusion regarding the nature of this tumour. In opposition to the observations of Garrigues we found in the fluid aspirated from this cyst undoubted evidence of malignancy in the groups of large sized many nucleated sprouting cells, as described by Foulis. But apart from any clinical knowledge of the case, Dr Foulis was able to arrive at the true nature of it by examination of the fluid only.

Anxious to do the best for my patient after fully explaining both to her and her husband my fears as to the ultimate result, I gave her the chance of benefit by operation, hoping that I might possibly be able to remove the tumour entirely, and that it might not have infected the peritoneum. But the result proved unsatisfactory, as the sarcoma had, before the operation, infiltrated the other broad ligament, though it had not apparently infected the peritoneum. Such a case, if operated upon early and completely removed, gives good reason for a favourable prognosis when the cysts have not burst through the cyst wall into the peritoneum previously to operation. But if it is impossible, as in this case, to remove all the sarcoma,

or if the peritoneum is infected previously to the operation, return of the disease before many months is nearly certain.

Professor Greenfield was good enough to examine this tumour also, and reports as follows :—" The tumour resembles in essential structure an ordinary ovarian cyst, but the stroma is in parts very highly cellular, resembling spindle-celled sarcoma in structure, and the vessels are unusually numerous and large. In some parts hæmorrhage has occurred into the substance of the tumour, producing a cavernous structure traversed by the cell network of the sarcoma-like tissue. The epithelium lining the cysts is very regular in structure and arrangement."

II. *Laparotomy for Removal of a Broad Ligament Cyst.*

Case VI.—Mrs H., æt. 46, residing in Dunfermline, admitted 11th September 1884, complaining of great swelling of abdomen and frequent desire to micturate. Patient has had five children, the youngest 14 years of age. Menstruation ceased three years ago, and immediately afterwards the abdomen began to swell. Since then the increase in size has been gradual.

Physical Examination.—Abdomen enlarged and distended, and tolerably symmetrical. Measurement round umbilicus is 47 inches. Feeling of tumour is uniformly smooth. Percussion note in the mesial line is dull throughout, only slightly clearer on approaching the ensiform cartilage. Right flank far back, loudly resonant. Left flank resonant, but less so. Percussion thrill can be felt, and the resulting movements can be seen all over the abdomen. *P. V.* —Uterus low placed and quite free. No part of tumour projects into pelvis. Sound enters 2½ inches.

Operation was performed on 18th September. The tumour was found to have no adhesion. The aspirator was introduced. The fluid removed was exceedingly clear, and amounted when measured afterwards to 45 pints; density 1012. The tumour was unilocular and attached by a comparatively narrow base to the left broad ligament. The right ovary was natural. The pedicle was secured in a Staffordshire knot and the tumour clipped off. The abdomen was now wiped clean, and the dressings applied in the usual fashion. The fluid weighed 57 lbs., and the cyst wall about 1 lb. Recovery was excellent. Flatus, per rectum, was passed the day after operation. Deep stitches were removed on eighth day; bowels moved same day. Dismissed, 22nd October 1884.

The fluid in this tumour was very characteristic of this kind of cyst. It gave no precipitate with heat and nitric acid, but a copious white deposit with nitrate of silver, showing absence of albuminoid contents, but the presence of chlorides. Such tumours belong to a class that occasionally do not refill after tapping. But apart from that being by no means a regular result, it appears to me that it is safer

to remove them than to tap. A cyst of such size flopping about in the abdomen is certainly not without risk even if it remains empty, as it may get strangulated by twisting its pedicle, or may get involved among the intestines in such a way as to interfere seriously with their action. On the other hand, as pointed out by Doran, these cysts not unfrequently contain papillomatous masses on their walls which, when they are tapped, may infect the peritoneum and thus lead to disastrous results.

Besides, the ease with which they can be removed is so great, as they can be completely emptied, and thus can be removed through a very small incision, whilst they rarely form adhesions, that it is scarcely possible the patient's life could be compromised by operation, provided ordinary care and skill is exercised in conducting it. These tumours explain some rather extreme statements occasionally made in obstetrical literature. Thus to this category belong the cases of so-called ovarian tumours that are now and then reported to be cured by tapping. To them also belong nearly all of those so-called ovarian tumours regarding which it has been reported that both ovaries have been removed, and yet the patient has subsequently become pregnant. They originate in the parovarian body or in the other remains of the Wolfian body contained within the folds of the broad ligament. They do not necessarily involve the structure of either ovary. In the present case the ovary was flattened over the base of the tumour. But in a case which I hope to relate to the Society by-and-by, and the cyst of which I recently showed to it, the cyst was entirely separated from the ovary. It is therefore quite possible to remove two such cysts without injuring either ovary or tube, and therefore without necessarily impairing the woman's procreative capacity. They can at once be identified from true ovarian tumours by their unilocular character, and by the fact that the peritoneum covers the cyst wall, which it does not in an ovarian tumour.

III. *Laparotomy for Removal of Sero-Sanguineous Cyst of Peritoneum (Mesentery ?)*

Case VII.—Mrs W., æt. 42, residing in Grangemouth, recommended by Dr Linton, was admitted on 6th September 1884, complaining of pain and swelling of the abdomen. About the middle of November last patient noticed a lump a little bigger than an orange in her left side, high up, which she took to be the head of a child. This went on increasing in size, at first markedly in a downward direction, and subsequently from side to side, till one month before admission, when she was suddenly seized with pains at night, which she took for labour pains. During this time she menstruated regularly.

Physical Examination.—The abdomen is distended uniformly to about the size of a seven months' pregnancy. Swelling is un-

usually prominent in the region of the umbilicus. Measurement round umbilicus = 36½ inches. Tumour is smooth in outline. Percussion dulness in mesial line to within 2 inches of ensiform cartilage. Flanks clear. Everywhere else is dull. Fluid thrill and fluctuation easily felt. *P.V.*—Vaginal portion of cervix hypertrophied. Uterus movable, displaced towards left and backwards. Sound enters 2¾ inches upwards and forwards.

On 16th September 1884 operation of laparotomy was performed. On making abdominal incision there was more venous hæmorrhage than is usual. On endeavouring to reach the peritoneum it was found absolutely adherent to the sac of the cyst, and it was impossible to separate them without wounding the latter. From the cyst a quantity of fluid having the appearance of a strong infusion of logwood escaped. This was partly aspirated and partly welled forth spontaneously. The sac of the tumour was excessively fragile, so that no forceps could hold it. On emptying the tumour the cyst wall was found *absolutely* adherent in *all* parts to the subjacent structures. It passed rather deeply into the pelvis, increasing markedly the depth and size of the utero-vesical *cul de sac*. The uterus was fixed between the position of retroversion and the normal, lying upon the left side of the anterior wall of the sacrum. The tumour was now slowly separated from the anterior wall of the abdomen and from the viscera, to which it became attached on being reflected high up from the anterior wall in all directions. Inferiorly, also, it was peeled off from the anterior *cul de sac* between uterus and bladder. This process was continued from above downwards, and from side to side until it was separated from the subjacent tissues. While doing so it was noticed that the peritoneal coat of a viscus on the left of the spinal column was torn for nearly an inch, exposing the muscular wall. This rent was carefully brought together by catgut sutures, and further attempts to remove the sac were desisted from, as it was seen to be firmly attached to the front of the abdominal column anteriorly over the aorta and vena cava. The loose portions of the tumour were now tied and removed by scissors; an elongated area, about the size in all of the palm of the hand, lying over the vessels as above described, being left untouched. No trace of anything like a pedicle connecting the tumour with either broad ligament could be found. The abdomen was now carefully sponged dry, when it was found that superiorly and laterally there was adhesive peritonitis in all directions beyond the point where the sac was found to be reflected from the anterior wall as above described. The wound was brought together in the usual manner, only a drainage-tube was put in the lower angle of the wound. The tumour with its contents weighed 12 lbs. Microscopically the fluid contained fibrine, blood cells, and detritus, and had a sp. gr. of 1035.

For the following description of the sac of the tumour I am indebted to the kindness of Professor Greenfield :—

"The wall of the larger cyst was lined with a very regular layer of columnar epithelium, exactly resembling that of an ordinary proliferous ovarian cyst. The cells were covered with a layer of coagulated fibrine apparently mixed with blood. At some points the epithelial layer was separated from the subjacent structures by a delicately fibrillated network of coagulated fibrine. The cyst wall was composed of a loose fibrous network, with but few cells, except ordinary connective tissue corpuscles. There were comparatively few capillaries. In the substance of the wall there were contained—1st, Other cysts having all the characters of the larger cysts, lined with typical large columnar epithelium, and containing similar coagulated fibrine, mixed with blood, partly forming a laminated structure on the epithelium, and partly a loose network in the cavity. 2nd, Rounded or ovoid spaces of various sizes, containing only a fibrinous network, devoid of epithelial lining, and looking at first sight like distended lymphatics. In some of these a few rounded cells like altered epithelial cells could be seen, and in others a flattened epithelial lining. Around most of these spaces the fibrous tissue was denser and circularly arranged in such a manner as to form a definite wall. From a comparison of a large number of those minute cavities I am inclined to regard them as abortive cysts, *i.e.*, cysts into which hæmorrhage or fibrinous exudation had occurred at an early period of their development, or transitional forms in all degrees between spaces containing only fibrinous coagula and distinct cysts lined by columnar epithelium were observed. The only character differentiating this from an ovarian cyst is the constancy of the fibrinous or sanguineous exudation in all the cysts, large or small."

On the evening of the operation the patient's temperature rose to 102°·2. The cavity was washed out twice. Brandy and champagne were given. During the next three days the cavity was washed out twice daily. On the ninth day after the operation the deep stitches were removed; some discharge, smelling badly, proceeded from the cavity. Iodoform dressing. On twelfth day a glass drainage tube was again introduced. On fourteenth day the discharge was more purulent. On the fifteenth day the glass drainage tube was changed for an elastic one. On the eighteenth day (October 3rd) the discharge was still considerable, with putrid smell.

7th October.—Discharge is decreasing in quantity.

10th October.—Cavity washed out with sulphurous acid 1-10.

13th October.—Temp. 101°·4. Passed a restless night. Cavity thoroughly washed out; a quantity of putrid membranous slough was squeezed out through the wound.

14th October.—Temp. normal.

18th October.—Wound still washed out; very little discharge or smell; sac greatly contracted.

22nd October.—Drainage tube removed in the hope that the cavity would heal up.

23*rd October*.—Examined by Dr Macdonald.

P. V.—Uterus has risen considerably in position; tolerably movable. Some thickening can be felt at the brim by the sides of the abdominal wound. Sound enters 2¾ inches upwards and forwards without pain. Wound entirely healed.

26*th October*.—Patient was to have gone home to-day, but the temperature rose to 102°. Wound was reopened, when a quantity of pus escaped. Drainage tube reintroduced.

31*st October*.—Cavity is being washed out with sulphurous acid daily.

22*nd November*.—The wound is now closed. The uterus is in normal position—can be felt projecting against the anterior abdominal wall about an inch above the lower edge of the cicatrix. There is some contraction of the left broad ligament, but no tumour and no tenderness. Behind in the fold of Douglas all is clear; the right broad ligament is perfectly clear, and not contracted. No fulness whatever is felt behind the incision. The contraction in the left broad ligament appears to be the remains of an old cervical tear. The abdomen is now resonant all over. Patient dismissed to-day.

26*th February* 1885.—To-day Dr Linton of Grangemouth reports that Mrs W. is well and has put on flesh. Since leaving hospital the wound broke out afresh, discharging a considerable quantity of pus. There is now a small sinus in the lower part of the abdomen, which continues to discharge a small quantity of pus, but which causes no special inconvenience, and does not prevent her attending to her household duties.

Such is the history of a case of rare interest. It was diagnosed by me before operation as a typical ovarian cyst. It was impossible from the tension of the abdominal walls to determine whether the tumour was or was not connected with the uterus by a pedicle. But if we trusted to this as a necessary element in the diagnosis of abdominal tumours, many of them would be impossible to diagnose. But the ordinary symptoms of encysted fluid in the peritoneum were so well developed, that, relying on them, I demonstrated the case to the class as an ovarian tumour. I was therefore not a little surprised to find that no trace of a pedicle could be elicited. I was also very much taken aback at the condition of universal adhesion of the tumour to the peritoneum, both visceral and parietal. Such a condition has never come across my experience in dealing with ovarian tumours. In every direction the tumour was absolutely adherent to its surroundings, whilst into its cavity numerous cysts filled with sanguineous contents projected. I have only met with one other similar case, in which a uniformly adherent cyst was found to take its origin in the mesentery. In this case I was successful in removing the entire cyst, but the patient died suddenly twelve hours after operation, apparently from pulmonary embolism. In this case the ovaries and uterus were discovered to be free from any connexion with the tumour. As

the broad ligaments were both flattened downwards and backwards by the extension of the tumour in the downward direction, it was impossible to make out in the hurry of its removal in what condition the ovaries were. I was only too glad to get the operation finished. But we could not make out anything having the slightest appearance to a pedicle or any greater adhesion of the sac to the broad ligaments than to any other part of its circumference.

The tumour was especially firmly adherent to the lower layer of the mesentery and to the vessels posteriorly. Moreover, from the history of the case it would appear that the tumour originated high up and grew downwards towards the pelvis. This is noted by Pean[1] in reference to three cases of somewhat similar tumours which he operated upon like me under the idea that he had got to deal with ovarian tumours. It was further to be observed, both in this case and in the other case to which I have already referred, that the tumour projected unusually far forwards in the region of the umbilicus, in that respect suggesting the appearance of a much anteverted pregnant uterus rather than of an ovarian tumour.

Considering Pean's cases, and collating them with my previous case, I was inclined to regard this tumour as most probably arising in connexion with the mesentery. The report of Professor Greenfield rather tends to the opinion that after all it may have been of ovarian origin. But if so, how it was related to the ovary, and under what conditions it came to assume the extraordinarily sanguineous character, and to have been so universally adherent, appear to me a complete mystery.

I record the case, however, in the hope that it may lead other operators to call attention to similar cases in their experience.

It is to be borne in mind, however, whether this tumour was mesenteric in origin or otherwise, that the mesentery is, as pointed out by Pean, and as proved by at least my first case, if not by this, occasionally the site of large cysts, which simulate ovarian tumours, and have to be borne in mind in forming a diagnosis. If seen early these can be diagnosed by reference to their origin on the left side of the spine in the umbilical region, and their tendency to develop downwards instead of upwards, as also by the prominent way in which they cause the abdomen to project in the region of the umbilicus. At first with such tumours there is resonance all round as well as at the sides. This I saw specially marked in a solid tumour of the mesentery, for which I made an exploratory incision about eighteen months ago in the Infirmary.

These characters ought to enable us to make a diagnosis in the early part of their history. But once such tumours crowd down into the pelvic inlet, I know of nothing short of abdominal section, except a careful study of their history and growth, that could help us to form a decided opinion.

[1] *Tumeurs de l'Abdomen et du Bassin*, p. 1103.

The universal condition of adhesion in the present instance made the outlook for the patient exceedingly unfavourable. But the tendency in the tumour to set up inflammatory adhesions on all sides was undoubtedly in favour of a successful issue. The adhesion of the bowel to the front wall at the point of reflection of the tumour superiorly converted the cavity from which the tumour was removed into a nearly complete extra-peritoneal cavity, and this being freely drained prevented absorption of putrid materials. All the parts of the sac left in front of the bloodvessels sloughed out and were discharged. The abdomen of the patient after operation was of a very peculiar appearance, as the adhesions prevented the abdominal viscera from passing into the space rendered empty by removal of the tumour. The pressure of the external air depressed the abdominal walls and made the abdominal surface assume the appearance of an inverted cone, which appearance, however, was gradually undone by the bowels working their way back to their normal positions. I may here state I found sulphurous acid a distinctly more effective means for preventing the smell of the contents of the abdominal cavity than carbolic acid, as well as much less irritating. The case further seems to teach that the most unpromising abdominal tumours may lead to satisfactory results, provided free drainage is safely secured.

IV. *Laparotomy for Removal of Uterine Appendages.*

Case VIII.—Mrs B., æt. 35, married sixteen years; no children. She thinks she had a miscarriage seven years ago. Admitted 21st April 1884.

Patient complains of pain in the left groin at each period which has tormented her for ten years, and which she is unable to trace to any attack of fever. There is no evidence of patient's having suffered from gonorrhœa or syphilis at any time. The pain occurs only at the periods, continues for about thirty-six hours at a time, and is accompanied by absolute prostration and inability to eat, sleep, or work. About two days after there is an attack of sickness, lasting about a day. During the attack of pain the left leg is usually enfeebled. For the last six months the menstrual flow has been scanty, but the pains have become intensified. There is much pain on coition.

Physical Examination.—Vagina short and wide. Uterus very tender and retroverted. The right ovary is hard and excessively tender, and somewhat prolapsed. The left ovary is felt with some difficulty in the anterior part of the left lateral fornix. In every respect other than her genital system the patient exhibits the appearance of fair though not robust health.

Operation on the 24th of May. The operation lasted 40 minutes. Some trouble was experienced in getting hold of the ovaries, owing to the deep position of the uterus and the peculiar shortening of the Fallopian tubes, especially of that on the left side. The left

ovary was first brought to the surface, and its attachment to the broad ligament secured by a two-linked silk ligature, the tying of the Staffordshire knot being prevented by the needle accidentally cutting through the ligature. The ovary and attached tube were then removed. There was no bleeding. The right ovary and attached tube were similarly treated, only that its attachment to the broad ligament was secured by a Staffordshire knot. The pelvis was then cleansed by sponge of any drops of blood that had fallen into it. The pedicles being found perfectly dry, the ligatures were shortened, and the pedicles dropped into the abdomen. The abdominal wound was then closed, and the wound dressed with protective and salicylic wool.

The patient made an excellent recovery, and was dismissed on 25th June 1884, looking well, and free from pain of any kind.

8th October 1884.—Patient returned to report herself. Has been quite well and free from pain ever since the operation. Sexual feeling retained, only the act now entirely free from pain.

Description of Structures removed.—Structures removed from right side consisted of ovary, to the outer edge of which was adherent what was evidently a portion of the tube next the fimbriated end. The fimbriated end itself arched over the upper border of the ovary like a hood, but was not adherent to it. The ovary was of a palish-yellow colour, with a tolerably smooth surface, under which there projected several small cysts, varying in size from that of a millet seed to that of a pea. The ovary measured $1 \times \frac{3}{4} \times \frac{1}{2}$ in. The adherent tubal portion when removed measured $1\frac{1}{4}$ in., and was slightly distended. On cutting into it there was found to be three tubular openings in it, each containing a small quantity of serum. The parts removed from the left side consisted of the ovary, to the outer side of which there was firmly adherent a mass, consisting apparently of the end of the Fallopian tube. The ovary resembled that of the right side, measured $1 \times \frac{3}{4} \times \frac{1}{2}$ in. The adherent mass, when viewed from above, presented a horseshoe-shaped contour, with, in the centre, a rounded projecting portion, the whole having the appearance of being formed of two convolutions of the Fallopian tube. The horseshoe-shaped portion, which formed the outer limit of the mass, measured $1\frac{1}{8}$ in. in both directions, thickness $\frac{3}{4}$ in. On measuring the length of what appeared to be the convoluted Fallopian tube it was found to be not less than $2\frac{3}{4}$ inches. Both ovaries were cystic.

This case has been already reported by me as part of a clinical lecture published in the *Edinburgh Medical Journal* for last year. It is satisfactory to be able to state that the operation was completely successful in removing the patient's distress. She has never menstruated.

Case IX.—Mrs M., æt. 32, residing in Edinburgh, was admitted on 5th September 1884, complaining of an intense pain in her right side. Patient has been married five years, and has had no

children. Present illness commenced four years ago. The pain was very severe, especially during defæcation and micturition. At other times, whether at rest or moving about, she was troubled with a bearing-down feeling. All along, patient says, she has felt a lump in her right side, and it seemed to be pressing down upon something. Nothing of this character has been felt in the left side, but a sharp lancinating pain has occasionally been present. A pain in back, usually worse at night, has also distressed her. Patient says her urine has been tinted, as if it contained blood. She has never enjoyed good health since her marriage. Dysmenorrhœa and dyspareunia are also complained of. Patient says she has aborted three times at the third month.

Physical Examination.—Right ovary somewhat prolapsed, distinctly enlarged, very tender. No distension to be made out in the broad ligament. Left ovary also enlarged, somewhat prolapsed, and excessively tender. Uterus is moderately retroverted, appears not to be movable, increased in size. Sound enters without pain $2\frac{3}{4}$ inches upwards and forwards.

Treatment.—On 13th September operation of abdominal section performed. Some difficulty was experienced in entering the abdominal cavity from the unusual amount of subperitoneal fat which simulated the omentum. It was found rather difficult to reach the ovaries on account of extensive adhesions, which were found to bind down the uterus and ovaries to the floor of the pelvis, more particularly the right ovary. The left ovary was ultimately brought to the surface. It was found to have an oblong oval cyst, $1\frac{1}{2}$ inches long by 1 inch in perpendicular depth, growing by a broad attachment to its free border. The tube was not enlarged nor attached to this ovary. The pedicle was fastened with a Staffordshire knot, and the ovary, with its attached cyst, removed, and the pedicle dropped. After considerable trouble the adhesions fixing the right ovary were divided, and it, along with a much dilated and thickened attached Fallopian tube, were with great difficulty brought within reach. During this manipulation an extravasation of blood in the tissue of the ovary burst, giving exit to a clot about the size of a bean. The mass was ligatured, and both the ovary and attached tube removed with scissors. There was no hæmorrhage. The abdominal wound was secured in the usual manner. The operation lasted 40 minutes.

Patient made a good recovery. She passed wind on the third day. Deep stitches were removed on the fifth day. Bowels moved after castor-oil on the seventh day after operation. Dismissed 9th October 1884.

12*th February* 1885.—Patient returned to report herself. She is well, and is entirely free from pain. There is no tenderness or fulness in the region of the ovaries. Sexual feeling remains unaltered. This case also is a complete success.

Case X.—Mrs W., æt. 30, residing in Edinburgh, was admitted

on the 20th August 1884, complaining of pain in hypogastrium and a sense of bearing down. Patient has been married ten years, and has had no children. Her present illness began a year after marriage, and has continued ever since. Dysmenorrhœa is present, and the pain is continuous during the intermenstrual period. About five years ago she was troubled with painful micturition, and ever since dyspareunia has been complained of. Her menstruation was painless before marriage.

Physical Examination.—Abdomen natural.

P. V.—Vaginal portion of cervix is chronically indurated and enlarged. Body of the uterus normal in position, size, and shape. Right ovary tender and somewhat increased in size, is movable, and somewhat prolapsed. To the left and slightly behind the uterus there is a soft, cystic-feeling mass about the size of a hen's egg, which is harder and firmer in its anterior portion, and which appears fixed, and is very tender.

On 6th October laparotomy performed. There was a little difficulty in entering the peritoneum on account of an unusual amount of subperitoneal fat. On reaching the uterus the ovary was found small and adherent to a dilated tube, and bound down by several firm adhesions. The left tube was found dilated into a considerable cyst. It was adherent to the left ovary, which was bound down to the ligament and uterus by firm and strong adhesions. After considerable difficulty the right ovary was brought to the bottom of the external wound and its pedicle secured in a Staffordshire knot, which isolated the ovary and the outer portion of the right Fallopian tube. These structures were now removed by scissors. There was no bleeding. An attempt was now made to grapple with the left tube and ovary. In order to obtain room the incision was extended upwards and the pelvis cleared of bowels, which latter were enveloped in warm moist towels. In endeavouring to isolate the left tube the cyst wall burst, and it discharged a considerable amount of thin fluid into the peritoneal cavity. This fluid was sponged out, and on re-examination it was found that the tubal cyst had completely collapsed. Whilst the adhesions attaching the left ovary were found to be more strong than was previously thought, it was therefore considered inadvisable to proceed further. The abdomen was sponged out, the bowels returned, and the wound brought together in the usual way. Patient made an excellent recovery. Flatus per rectum passed on the second day. Deep stitches were removed on the seventh day. On the eighth day bowels moved after castor-oil. Dismissed 6th November 1884, feeling well.

I have delayed my observations on these cases so as to include them all in one note. It will be seen that each of the cases presented points of extreme divergence, whilst at the same time they exhibited much in common. The symptoms, indeed, were those of great distress and pain gradually wearing out the strength of the patients. There was evidence in all these cases that there were

gross lesions affecting, if not the tubes also, the ovaries certainly. It was plain, therefore, that removal of the diseased structures was not removal of the normal ovaries. That operation is seldom warrantable. It is indeed uncertain whether, if we are satisfied the ovaries are healthy, it is ever warrantable, except in a case of high pelvic deformity, to prevent subsequent conception. It is never otherwise proposed, so far as I know, except in the hope to remove some specially severe reflex result of ovarian origin, such as insanity or epilepsy. The determination of an accurate diagnosis is under such circumstances exceedingly difficult. The nervous lesion is undoubtedly there. Whether it is centred in the ovary or not must always be a matter of opinion. The results from such operations in the hands of Mr Lawson Tait are affirmed by himself to be far from encouraging. But while normal ovariotomy is seldom warranted, and, so far as I know, seldom proposed, the question is very different when we have got to deal with distinctly diseased appendages. In some cases, doubtless, there is cirrhotic disease of the ovaries, giving rise to extreme distress without producing any demonstrable gross lesion detectible by ordinary clinical examination. But in the majority of cases presenting those distressing symptoms there is demonstrable ovarian or tubal disease to be made out. It is most common, as Lawson Tait points out, to find the tubes adherent to the ovaries by the fimbriated extremities. When that takes place dilatation of the tubes, apparently the result of obliterative catarrh, takes place, the catarrhal condition producing such swelling of the mucous membrane of the part of the tube next the uterus as to obliterate its lumen, whilst the adhesion of the trumpet-shaped extremity prevents escape of fluid at the ovarian end. This fluid, according to the degree or nature of the catarrh, may either be clear fluid, muddy coloured fluid, or pus. I have seen these three varieties, but there are no doubt others. The changes in the ovaries I have always found to be a combination of cirrhosis with cystic degeneration. I have always found decidedly more structural change after operation than I had previously expected. Though the change in the tubes is usually of the nature of an obliterating catarrh, other changes of a different nature are found. It will be noticed that in Mrs B.'s case there was no dilatation—the reason apparently being because the fimbriated extremity was not blocked. But the changes were cystic disease of the ovaries and a peculiar folding up or rolling up of the tubes apparently due to the action of adhesive peritonitis on their peritoneal coat. In Mrs M.'s case the left ovary was free and the tube healthy; but the ovary contained a large cyst. On the other hand, the tube was attached to the right ovary and was dilated and thickened. In Mrs W.'s case there was evidence of extensive perioöphoritis. The right tube was adherent and dilated, whilst its corresponding ovary was small. The left tube was converted into a large cyst adherent to the left ovary, which again was firmly bound down to the ligament and uterus by powerful bands, the result of adhesive inflammation. In this case

manifestly the result was due to an obliterating catarrh; the ovaries had partaken freely in the tubal inflammation. The painful micturition from which she suffered five years previously, and which had been followed ever after by dyspareunia, was, I do not in the least doubt, caused by a gonorrhœa which extended upwards, and led ultimately to the pathological condition found at the operation. I regret exceedingly that I had not the courage to complete the operation. With additional experience since gained, and with better skill in the use of sponges in packing aside the intestines, as also with the aid of the electric lamp, I feel certain I could now safely finish such an operation. At any rate the free bursting of the sac formed by the dilated tube relieved tension, and the patient was dismissed feeling quite well. We have not yet heard from her, so that we are unable to state whether the improvement will be permanent.

I have performed several of these operations since November, and will be able to record the cases by-and-by. The main secret of successful removal of these cysts when deeply placed does not consist in removal of the intestines from the pelvis, as we did, which is a riskful expedient and gives little help, but in carefully packing sponges round the cyst so as to expose it to view and keep the bowels out of the way, whilst a good light, such as an electric lamp, is made to play upon the parts and expose any bleeding points. We must also be able to ligature the parts in position before removal, as separation of non-ligatured adhesions is apt to lead to troublesome bleeding, which is difficult to arrest completely.

The later operations are too recent to say anything regarding the benefit to be expected. But my three first operations have been completely successful. These are the two first of the three recorded here, and another previously reported. In all these three complete relief of symptoms, with arrest of menstruation, have resulted. In two of these the sexual appetite has remained unaltered. In one of them sexual desire has been abrogated. In one of them, the first I recorded, there was some pain on the left side for some months after operation, but, as has happened in Lawson Tait's experience, this has gone completely away. The cause of such pain is clearly some change in the cicatrix, which disappears after a time. I therefore confess myself a convert to the opinions of Mr Lawson Tait on this subject, "impune it whoso listeth." I have seen enough to satisfy me that in a considerable number of otherwise incurable and excessively distressing cases complete relief from suffering and return to usefulness is afforded by the removal of the uterine appendages. Ovarian neurosis I believe will soon be largely a thing of the past, along with ovarian irritation and other terms which have been used to serve as a cloak for our ignorance. The ovary is not such a terribly wilful organ as to lead to such distressing results when it is healthy and functioning normally. Advance in exactness of diagnosis will, I doubt not, enable us to discriminate

with much greater precision between the various degrees and varieties of ovarian and tubal changes. The operation is, as I have found out, practically a very difficult one, much more so as a rule than ordinary ovariotomy; but it is not a dangerous one if care is taken not to introduce septic matter into the peritoneum. There is, of course, great danger of pushing the operation too far and bringing it into discredit through its unnecessary application. That is an objection which can be urged with some force against every improvement, and can only be avoided by a careful examination of the cases and a conscientious weighing of the pros and cons for operation in the individual cases. Those that present the enlarged ovaries or tubes high placed and movable are much more easily operated on than those in which the diseased parts lie deeply in the pelvic cavity and are fixed. But I do not believe we ought to delay operating until the patient is reduced to a state of extreme debility by pain and distress, although this view finds favour with some excellent authorities. I am satisfied, so soon as we are certain that the ovaries or tubes are distinctly diseased and are not likely to yield to our ordinary methods of treatment, which are confessedly very unsatisfactory, we are bound to at least inform our patient of the possibility of relieving her by operation. I have always been, as I have said above, surprised to find the pathological changes disclosed by the operation much more pronounced than I had previously expected. I think we are bound to give the patient a chance of relief before undergoing years of torment and exhaustion. It is idle to argue that you are depriving the woman of her reproductive powers. In almost every case you will find, when you proceed with the operation, that natural causes have already completely destroyed that function. The ovaries and tubes will be found already incapable of taking their part in the reproductive function, and are merely sources of distress and discomfort to the unfortunate patients.

There are many points of interest in regard to the diagnosis of these conditions, but these I will postpone until a future occasion, as I feel I have already trespassed far too much on your indulgence.

Appended is a synoptical table of the ten cases operated upon, with the results.

No.	Name.	Age.	Medical Attendant.	Disease.	Date of Operation.	Result.
1	Mrs D.	52	Dr Thomas, Selkirk	Ovarian Cystoma	28th June	Recovery.
2	M. W.	57	Dr Thomson, Musselburgh	Ovarian Cystoma	10th July	Recovery.
3	Mrs B.	44	Dr Wilson, Mid Calder	Ovarian Cystoma	10th Sept.	Recovery.
4	Mrs D.	58	Infirmary	Ovarian Cystoma	21st Oct.	Recovery.
5	Mrs M.	52	Infirmary	Ovarian Sarcoma	8th Oct.	Recovery.
6	Mrs H.	46	Infirmary	Parovarian Cyst	18th Sept.	Recovery.
7	Mrs B.	35	Dr Spence, Burntisland	Disease of Uterine Appendages	24th May	Recovery.
8	Mrs M'M.	32	Infirmary	... ...	13th Sept.	Recovery.
9	Mrs W.	30	Infirmary	... ...	6th Oct.	Recovery.
10	Mrs W.	42	Dr Linton, Grangemouth	Cyst of Peritoneum	16th Sept.	Recovery.

Dr Wilson congratulated Dr Macdonald on the success attending his operations, and the Society on the communication of such an interesting paper. So numerous were the important points discussed in it, that he felt sure the paper would be referred to in future years as authoritative.

Dr Foulis was glad to have been present when these interesting cases were described. He had often seen Dr Macdonald operate, and had been struck with the great power of adaptation of means to ends which he had shown. Amongst other things, he was pleased to see the success with which Dr Macdonald was now employing the electric light for the exploration of the abdominal cavity. With reference to the case which Dr Macdonald mentioned as having been reported on by him (Dr Foulis), he was quite ignorant of the nature of the case when the fluid was sent, but his examination left him no doubt that the case was a malignant one, as the evidence of the microscope was conclusive. He had often been struck with Sir Spencer Wells's results, in which he finds that one out of every 100 cases operated on some return after a certain time and die of malignant disease. Dr Foulis is of opinion that these are cases of sarcoma, but, nevertheless, thinks they should certainly be operated on, as in many of them the operation gives an extension of seven or eight years of life. With regard to the case of mumps, he recollected a case in which a young girl had swollen and painful breasts, as a complication of the attack; and it was interesting also that her father, when suffering from mumps, had an attack of orchitis. One distinction between ovarian and parovarian tumours was worthy of note, namely, that parovarian cysts have the bloodvessels distributed between the peritoneum and the tumour, and not *in the wall* of the cyst, as is the case in the ovarian tumour. With reference to the important question of the diagnosis between ascites and ovarian disease, he would like to say a few words. The abdomen has often been opened by surgeons under the impression that the patient was the subject of ovarian disease, while only ascitic fluid was found. Various attempts had been made by the aid of the microscope and chemistry to distinguish between the fluids, but the results of such attempts have not been satisfactory. It was, however, of the highest importance that we should bear in mind one cardinal distinction between them, as to their mode of production. This is, that the ovarian fluid is always a secretion, elaborated by a secreting apparatus; while ascitic fluid is the exudation resulting from an obstruction, and is in no sense of the term a secretion. Now, as a result of numerous examinations extending over a period of upwards of ten years, he had never found that an ovarian fluid, however long kept, ever deposited a precipitate spontaneously; whereas very frequently in the case of ascitic fluid such a spontaneous precipitate appeared within a period varying from a few hours to a few days. This precipitate of a felted character generally occurred in ascitic fluid, and is

specially abundant in cases of an inflammatory character. It consists of a fibrinous mass of interlacing fibres, reminding one of the structure of felt. Now, while ovarian fluid shows no such deposit, it contains other special structures which are characteristic, among which we note chiefly that body known as the "*ovarian granule cell.*" By a regard to these and other points he had no doubt whatever that the diagnosis might be made absolute, and that all mistakes of the nature referred to might be avoided. He was especially pleased to find that the Edinburgh School was now capable of turning out such results as those Dr Macdonald had given an account of to-night.

Dr Skene Keith observed that Dr Foulis seemed to consider the diagnosis between the fluids a comparatively easy matter, but he was of opinion that he made too light of the difficulty of recognising the cells when one saw them under the microscope. He (Dr Keith) had seen many such cells, and he was even yet by no means certain of their characters. It was comparatively easy to recognise malignant cells, and yet he had observed in more than one book drawings of cells which were described as malignant, but which he had no doubt were quite simple. He did not agree with Dr Macdonald as to the association between parotitis and operations on the ovary. He had seen at least 520 cases of abdominal section, and had only seen one of these in which parotitis occurred as a complication. This was one where a small round-celled sarcoma was removed from the umbilicus, and he was certainly inclined to attribute the complication to a mere coincidence. Dr Macdonald had stated that in the case in which rupture had occurred no history of the time of its occurrence could be obtained. This Dr Keith thought a common experience. It seemed difficult to account for the rupture. The tumour one day could be felt entire, and the next day might have ruptured without anything having occurred, so far as one could see, to account for the accident. Probably it is simply due to gradual thinning of the wall. He had often experienced great difficulty in getting rid of the jelly-like masses which some of the cysts contain. He does not think that these cases require a drainage tube, and has only seen one such case die. He does not think, however, that a drainage tube can do much harm, and fails to see how germs can get in there any more than during the time of the operation, when the whole cavity is exposed to them. He was of opinion that, certainly in young patients, a parovarian cyst ought always to be cured by tapping. He did not think that we need fear their twisting, as they have usually a broad base, which renders it almost impossible for them to do so. He suggested that in the case where Dr Macdonald was not certain as to the nature of the tumour, it might have been an ovarian tumour which had twisted itself off, become adherent, and subsequently commenced to grow again. He asked Dr Macdonald as to his experience with the Staffordshire

knot, as to whether he found it in all cases satisfactory. With reference to the cases of removal of appendages, he mentioned a case in which Dr Thomas Keith recently removed the appendages, where much pain occurred at menstrual periods owing to stretching of the adhesions by which they were tightly bound down.

Dr Macdonald, in reply, stated that he was obliged to Dr Skene Keith for his exceedingly ingenious suggestion that possibly the cyst, regarding whose nature he was in doubt, was after all an ovarian tumour which had originally become twisted off from its pedicle, and had subsequently become adherent in all directions, and thereby had continued to grow in a sort of way. It seemed to him a very likely explanation. In reference to the tapping of parovarian cysts, it is of course a subject regarding which operators might agree to differ. He had seen one completely cured by tapping. But this was by no means the necessary result, as witness the curious story reported of the history of such a tumour by Goodell. This one kept constantly filling till it was ultimately removed. He himself is of opinion that it is right to remove them, both on account of their known tendency to contain papillomatous growths, and also in case they should twist. The latter is by no means so impossible as Dr Skene Keith maintains, as evidenced by the tumour recently shown to the Society by himself in which 1½ twists existed. Moreover, with regard to drainage, as a consequence of considerable experience he is disposed to think that in the Infirmary, at least, drainage is a continuous source of danger from the proximity of beds containing patients from whom highly septic effluvia are being given off, and consequently, when possible, he is anxious to avoid the use of the tube. He listened attentively to Dr Skene Keith's statement regarding the rarity of parotitis as a complication of ovariotomy. Whether the view he himself expressed is true or not can only be solved by more extended observation. But as the coincidence happened in his own hands twice in simple operations, out of a much smaller number of cases than those referred to by Dr Skene Keith, he is certainly inclined to consider the occurrence as possibly much more than a mere accident. The Staffordshire knot he had always found perfectly safe, and much more easily applied than the ordinary chained suture, unless the pedicle was exceedingly broad. He felt greatly obliged to all the speakers for their kindly criticism.

Meeting VII.—April 8, 1885.

Dr James Young, afterwards Dr Underhill, *in the Chair.*

I. *Dr James Ritchie* showed a PLACENTA exhibiting circumscribed hæmorrhages of recent and of older date. It was part of the result

of the second pregnancy of a patient, æt. 23, who miscarried exactly at the end of seven times twenty-eight days from the commencement of the last menstrual period. Five days before the date of miscarriage, after walking about a mile, she was seized with pains, drove home and went to bed. The previous day she had a little more fatigue than usual, but was not aware of having suffered in any way, and prior to this had felt in her usual health. The pains subsided after resting, but recurred the following evening upon getting out of bed, and again two days later after a dose of castor oil. Five days after the first symptoms, being seized with more severe pain at regular intervals, she thought it necessary to seek aid. When first seen she was rather pale; the os uteri externum dilated to the size of a crown piece; there had only been a few spots of coloured discharge; the membranes were not tense between the pains. After a short time a small, poorly-nourished female child was born, and five minutes later the placenta was expelled without pressure, and almost immediately about 12 oz. of dark, firm, polyhedral clots with rounded margins. The uterus remained well contracted. The placenta, as exhibited to the Society, showed two depressions, one of them $1\frac{1}{2}$ inch × $1\frac{1}{4}$ inch and $\frac{1}{4}$ inch deep, the other of double the area and extending deeply, the placental structure being firmly compressed. In the recent state these cavities were filled with dark, firm blood-clot. Near the margin of the placenta there were still *in situ* three oval clots $1\frac{1}{2}$ inch long. Near the centre were two small, rounded, decolorized masses, which might be shelled out. The placenta was in several places fattily degenerated. The chief interest of the specimen related to the circumscribed hæmorrhages of recent date. The date could be fixed with tolerable certainty, viz., five days before labour set in. The clots had acted as foreign bodies, exciting uterine contractions, eventually labour, and further hæmorrhage, as evidenced by the firm, polyhedral clots expelled immediately after the placenta. The period, the seventh month, at which uterine contractions are more active than during earlier months, and near to what would have been a catamenial period, being the time at which placental hæmorrhage is most likely to occur. The decolorized clots indicated smaller hæmorrhages of older date.

II. ON INFANT FEEDING.

By James Carmichael, M.D., F.R.C.P. Ed., Physician to the Royal Edinburgh Hospital for Sick Children, University Clinical Lecturer on Disease in Children.

Mr President,—Of late years so much attention has been devoted, both on the Continent and in America, to the subject of infant feeding, that I thought it would not be inappropriate to bring the matter before this Society, in order that we might have

an opportunity of discussing a subject in which we ought ever to take a lively interest.

In leaving the beaten track of obstetrics and gynecology for a short time, to consider this subject, we must remember that all of us must, of necessity, not only be obstetricians but pediatricians. The duty of advising as to the careful nursing of the infant is one which is incumbent upon us, second in importance only to the attention to the mother during the puerperium.

The fact that an increasingly large proportion of mothers, in our town populations, at all events, are either totally or partially unable to perform the maternal duty of lactating their infants, is one which will be generally admitted. The causes which lead up to this might form an interesting subject for investigation, and one, I think, which it would not be foreign to us as obstetricians to take up. No doubt a variety of causes are at work, which tend to deteriorate the health of our women and interfere with the physiological functions of childbearing and lactation. At this time, when the question of over-pressure in schools is so much under discussion, the public have a right to ask us, as physicians, Why it is that so many young girls suffer from disorders of menstruation? why it is that so many of the mothers of the middle and upper class particularly are so unequal to the task of childbearing and lactating? Whether the artificial mode of living which obtains in society, whether the over-education of our girls, the pressure put upon the intellectual faculties and the nervous system, and the neglect of the more careful attention to physical education and bodily development in them, is not gradually and slowly undermining their constitutions, and rendering them less and less fit for the most important function they have to perform, of being healthy mothers. The whole subject is one which might not inaptly be considered at some future time by our Society, but does not come within the scope of my paper this evening.

In discussing the subject of infant feeding we start from the standpoint that mother's milk is the natural food of the child. This is a matter which as physiologists we all admit; and the question which we desire to answer is, What is the best substitute for the mother's milk when, from whatever cause, the child is unable to obtain it? In selecting a suitable form of nourishment for the infant, physicians in all ages have been in the habit of substituting a food, which is, as nearly as possible, in chemical constitution and physiological properties, like that of the mother. It is now generally admitted that cow's milk, when treated so as to assimilate it closely to woman's milk, is probably the most suitable food for the child which is conveniently at our disposal, and I purpose considering what is the best method of dealing with it in order to make it digestible, assimilable, and sufficiently nutritious for the young infant. I do not propose to discuss, but will merely refer to, the various artificial foods

which are now so prominently brought before the public. Many of them are most carefully prepared, so as to resemble as nearly as possible in chemical composition mother's milk, and form useful additions to cow's milk, under certain conditions.

It must be admitted that the majority of infants may be reared on cow's milk properly treated so as to insure digestibility. A small proportion of children cannot digest cow's milk apparently under any circumstances, and we are compelled to resort to a wet nurse in order to save the child. No rule for administering cow's milk to children, I believe, can be laid down which will be found to be universally applicable. When we come to rear children artificially we find that, as with adults, they have their peculiarities in regard to digestion. It is therefore necessary that in the case of each infant we should find out what plan of dealing with the milk will best insure its proper digestion, at the same time maintaining the nutritive ingredients as nearly as possible in proper proportion.

The first essential requisite in regard to milk is *freshness*. It must always be borne in mind that we are dealing with a fluid which is peculiarly liable to decomposition from external influences which do not operate in the case of mother's milk, which is drawn directly into the child's mouth without being exposed to the air. It is probable that from the moment milk comes under atmospheric influence certain changes begin. Lister [1] says, "Milk is a pabulum for all kinds of organisms; nearly all varieties of bacteria will live in milk." Baginsky [2] corroborates this, and has shown that woman's milk is less liable to decomposition from external influences than cow's milk. In warm weather we know that milk decomposes with greater rapidity, and often acts as a veritable poison—no doubt from contamination with lower vegetable organisms—to young children, producing cholera infantum, or gastro-intestinal catarrh.

In order to insure freshness in the milk it is necessary that it should be obtained several times a day direct from the cow; that if possible it should be milked directly into the vessel, which should be at once covered, or stoppered in the case of a bottle, and sent on to the nursery for use. It is, of course, absolutely necessary that the cow be a healthy animal, and grass fed if possible. It is well known that there is a difference between the composition of the milk of grass-fed and stall-fed cows, especially as regards its reaction. In this connexion I wish to allude to the practice of *boiling* or *cooking* the milk. In large towns the difficulty of obtaining fresh milk is often so great that the practice of boiling it before use is frequently resorted to. Are there any objections to so doing? and if not, are there any advantages to be derived from the practice? It has been argued that boiling alters the constitution of the milk, and renders it less digestible. In the process of boiling certain

[1] *Path. Soc. Transactions*, 1878, p. 425.
[2] *Berliner Klin. Wochenschrift*, Feb. 21, 28, 1876.

proportions of gases—chiefly carbon-dioxide, nitrogen, and oxygen —are expelled, along with certain other volatile constituents believed to be present in milk. Small proportions of casein and fat are separated in the form of scum. The liberation of suspended oxygen is believed, with good reason I think, to retard rather than otherwise the process of lactic fermentation. Boiling likewise tends to destroy any bacteria or other fungi which may be present. In practice it will be found that cooked milk will undoubtedly remain fresh a much longer time than uncooked. The digestibility of the milk likewise does not seem to be interfered with, but rather favoured by the process. On the whole, I think we are justified in concluding that the practice is a safe one, and should be generally resorted to in towns, more especially in summer. Care should be taken that the milk be boiled in a clean glazed pan specially reserved for the purpose.

Having secured as nearly as possible absolute freshness in the milk to be used, we have next to consider what further treatment is necessary before administration to the infant.

It will be almost universally admitted that undiluted milk, chiefly on account of the quality and amount of the casein, can seldom be digested by the young infant. In order to diminish the proportion of casein, and render it more soluble, a dilution of the milk with water or other bland fluid is generally resorted to. There can be no doubt, I think, that we find in practice that dilution is necessary, although we may not quite agree as to the proportion in which the diluent should be added. The ordinary diluents are either water, lime-water, or barley, oat, or wheat meal decoctions, according to the necessities of the case. In thus diluting the milk it must be borne in mind that we not only render it more digestible, but reduce the proportion of the various nutritive ingredients, so that it requires further treatment in order to bring it up to the proper nutritive standard. To attain the desired end we usually proceed on the principle, which is a good one, and to which I have already alluded, of assimilating it in composition to that of the mother, and in doing so we have regard to the relative composition of the two fluids. Here let us refer to the relative composition quantitatively and qualitatively of woman's and of cow's milk, and we naturally look to the information given us by physiological chemistry on these points. Here we find there are many difficulties to be encountered, for, unfortunately, chemists differ widely in the results of their investigations in regard to the more important constituents of the milk. In comparing the analyses of various chemists the discrepancy is very remarkable, but we find that this only holds good in regard to two of the constituents, but these are of great importance in nutrition. I refer to the casein and sugar. The estimation of the water is a simple process, and here the results of quantitative analysis present no discrepancy. The same remark holds good with regard to the fat. How such very different results can be arrived at in the quantitative estimation of

the casein and sugar I do not pretend to explain, unless on the supposition of faulty methods in analysis. Dolan and Wood estimate the casein at about 7 per cent., Vernois and Becquerel at 3·924 per cent., Henri and Chevalier at 1·52 per cent., Meigs at about 1 per cent., L'Heretier at 1·30, and Payen as low as 0·21 per cent. Another curious fact in all these analyses will be noted, however, that the sums of the casein and sugar added collectively together amount to very nearly the same, about 7 per cent. This proves that the difficult part of the analysis is the separation of the sugar and the casein. Who, it may be asked, is to decide when chemists differ? for unless we have a fixed standard to guide us, it is difficult to attain satisfactory results in carrying out the principle of so treating cow's milk as to assimilate it as nearly as possible in the relative proportion of its various constituents to woman's milk. Hitherto the absence of scientific data has forced us to be content with the empirical results of practical experience, for, as we have just seen, even yet our knowledge of the exact composition of human milk is imperfect. In trying, then, to reconcile the results of practice with those of chemical analysis, and endeavouring to arrive from experience at some deduction as to which of the various analyses of woman's milk is most probably correct, I shall first allude to the albuminoid ingredients, notably the casein, which is not only one of its most important constituents from a nutritive point of view, but the one which in cow's milk most frequently gives rise to indigestion and all its consequences. This most important proteid element as it exists in cow's milk is not only present in larger quantity, but also has different physical and chemical qualities to that found in woman's milk. Cow's casein is a white substance in its moist state, soluble in water, in the proportion of 1 to 20, forming a slightly acid solution, reddening litmus paper. Woman's casein is much more soluble in water, forming a neutral or slightly alkaline solution. When subjected to the action of gastric juice outside the body, woman's casein dissolves quickly and readily. Mineral and also organic acids, along with the digestive ferment, coagulate cow's casein into hard lumps; no such effect is produced on woman's casein. What, then, are the results of experience upon which we are agreed? I have already alluded to the fact, and it will, I think, be generally admitted, that very few young infants can digest undiluted cow's milk. This is probably due to the quantity as well as the quality of the casein. We are, therefore, in the habit of adding a large proportion of some diluent, generally water or lime water, or some bland mucilaginous decoction, such as barley decoction or thin gruel. This practice without doubt renders the milk more digestible, and the usually received explanation of it is that the result is brought about by dilution, and in the case of mucilaginous decoctions by the mechanical separation of the casein particles in coagulation, whereby they are more readily acted on by the digestive juices. In practice we find that very considerable dilu-

tion is required to effect this, an addition of an equal or even larger quantity of the diluent being necessary to insure proper digestion. This means a reduction of the amount of casein by one-half; and in practice we find that milk diluted in this proportion appears to be a nourishing food for a large proportion of children; but the question for us to decide is whether it is *sufficiently nourishing for all the requirements* of the growing child. For be it remembered that in thus diluting the milk and reducing the proportion of casein, we also diminish the quantity of the other ingredients, such as the sugar, fat, and salts, below the standard that is theoretically requisite for the proper nourishment of the child; taking mother's milk as our type. In order to remedy this, and restore the relative amounts of the constituents to their proper proportion, several plans have been adopted of late years. I shall now allude to the most recent methods, which I think worthy of note. The Aylesbury Company, of London, make what is called Artificial Human Milk on the principle recommended by Dr Frankland. This consists in taking half a pint of skimmed milk and keeping it at a temperature of 96°, and placing in it a piece of rennet one inch square. This is kept warm near the fire until the curd separates. The whey is then poured off and boiled in a saucepan. A measured quantity of one-third of a pint of this whey is treated while hot with 110 grains of lactose. This is allowed to cool, then two-thirds of a pint of new milk is added along with two teaspoonfuls of cream. The milk on analysis gives the relative proportion of constituents as nearly as possible the same as human milk. In practice it will generally be proved that very young infants do not digest this well, and that it is advisable at first to use one-half instead of one-third of a pint of whey, which seems to agree better with the child.[1] The next process I would refer to is the well-known one introduced by Dr Roberts of peptonizing or digesting the milk. This is especially valuable in infants affected with gastro-intestinal catarrh during bottle feeding. The milk may be either peptonized with liq. pancreaticus and bicarbonate of soda in the ordinary way, or using Burroughs & Wellcome's peptonizing powders; and the preferable plan will be to use skim milk, restoring the cream to the milk after peptonizing. I do not consider peptonized milk, from its taste and the trouble of preparing it, a suitable ordinary food for infants, but it is most useful as a temporary one in a variety of cases. The next method I should like to refer to is Biedert's. In an article in *Virchow's Archiv*, B. 60, 1874, he says that according to his experience infants will not digest more than 1 per cent. of cow's casein, and although he believes the older analyses of cow's milk, which estimate that ingredient at 4 per cent., to be correct, thus appears, as regards his practice, to confirm the results of the more

[1] Unfortunately on account of the expense of transit this milk is unattainable out of London.

recent observers who believe that the milk actually contains only about 1 per cent. of casein. He has proposed his well-known cream mixture, which he considers a sufficiently nutritive food for young children. It is composed of one part of cream to four of water, with 15 grammes of milk-sugar added to half a litre of the mixture. This mixture is often retained by the stomach when most others have been rejected, and may be frequently made use of as a temporary food until the stomach is able to retain one of the ordinary milk mixtures. Dr Meigs of Philadelphia, one of the leading authorities on infant feeding in America, and whose recent researches on milk go far to prove the correctness of the analyses of those who estimate the amount of casein in woman's milk at little over 1 per cent., has proposed a mixture which, theoretically and in practice, is as nearly as possible a perfect food for nursing the young infant. The plan adopted in making up the food is to bring the proximate principles into as nearly as possible the exact proportions in which they exist in human milk. The cow's milk is diluted until the requisite proportion of casein is obtained; this, of course, likewise reduces the quantity of fat and sugar, which are afterwards added in the shape of cream and milk sugar to the required amount. The directions given are as follows:—"Packages of milk sugar containing 17¾ drams in each are obtained from a druggist. The contents of one package are dissolved in a pint of hot water. This must not be kept longer than twenty-four hours, as it is apt to sour. When the child is to be fed, two tablespoonfuls of cream, one of milk, two of lime water, and three of the sugar water are mixed together, the mixture warmed and given to the child." An excellent mixture, which I have long used and can confidently recommend, is made on similar principles,—3 ounces of fresh milk which has been boiled for about three minutes is placed in the feeding-bottle, then 2 drams of fresh cream are added, 2 ounces of lime water, and 1 ounce of pure water, in which is dissolved 30 grains of Morson's saccharated wheat phosphates. This supplies the elements of nutrition in nearly the proper proportions, and will be found to agree well with the child. With many children it will be found that by substituting barley, rice, or oatmeal decoction, the mixture agrees better. Barley decoction is one of the most useful of all the diluents for cow's milk which we can make use of. In itself it contains most of the nutritive elements required by the child, and in cases where milk in any form disagrees from the occurrence of gastric catarrh, the child may be sustained for a long time upon it, especially if a little cream and lime water be added. The ordinary practice, which so many of us have followed for years, of nursing infants upon milk simply diluted with water, or lime water and a little cane sugar added, is certainly faulty in a theoretical sense, although it must be admitted that children will rear upon it in spite of its deficient nutritive properties, as it is wanting in the due pro-

perties of fatty and mineral ingredients. This can always be remedied by adding cream in due proportion, and milk-sugar, or such a preparation as the saccharated wheat phosphates to which I have alluded.

A consideration of the milk feeding of infants would not be complete without allusion to the condensed milks so much in use. There are numerous brands of these in the market, but they may be all classed in two varieties—the sweetened and unsweetened. Scientifically speaking, comparatively little attention has been paid to these milks in this country, although they are largely used in the rearing of infants. On the Continent, both in France, Switzerland, and Germany, most elaborate investigations have been pursued regarding the value of condensed milk as a food for infants. Time will not permit of my doing more than to allude shortly to these. Dr Baginsky and Dr Kaltenbach, and others have written on the subject. The French Society of Hygiene appointed lately a committee to investigate the nutritive value of these condensed milks, but especially to examine a memoir relating to them by MM. Pellet and Biarel. The conclusions arrived at by this commission were tested and corroborated by M. Chesnel, of the National Agronomic Institution. This investigation related solely to the sweetened condensed milk of commerce, and the following conclusions were arrived at:—"1. Condensed milk containing sugar, diluted with twice to four times its weight of water, may be considered an article of food, and in some cases would prove useful. 2. Artificial milk thus prepared is incontestably inferior to good cow's milk. It is a healthy article of food, but only slightly nutritive. 3. The directions given for its use are calculated to mislead the public. Condensed milk diluted with from six to ten times its weight of water cannot be classed as an article of food. 4. Condensed milk may form part of the daily nourishment of infants, but it would be certainly imprudent to use it alone." Here is a scientific opinion based on scientific evidence. Turning to the experience derived from the results of practice in this country, what do we find? Unfortunately, general practitioners have brought forward no scientific data in support of the value of sweetened condensed milk as a food for infants. There can be no doubt, however, in this country it is largely used to rear young infants upon, and with apparent success. It is usually diluted with from seven to fourteen parts of water, or even more. With even seven parts of water added it is sadly deficient in both saline and proteid elements, and theoretically must be considered insufficient for the proper nourishment of the child. As a matter of fact, it is readily digested by most infants, even when cow's milk disagrees. Children apparently thrive and grow fat upon it, in spite of its deficient nutritive qualities. It is generally believed that those reared solely on it are defi-

cient in bone and muscle, and liable, when older, to such diseases as rachitis and other constitutional depravities. Viewed as a food from the chemical and physiological standpoint, it must, I think, be unhesitatingly condemned, and medical practitioners, in my opinion, undertake very serious responsibility in giving unreserved sanction to its use. On account of its palatable nature, and the fact that it keeps well, and generally agrees with the child so far as digestion is concerned, it is very popular among mothers and nurses.

Of late years numerous brands of unsweetened condensed milk have come into the market. They all pretend to be simple condensed milk without any addition, and the results of analysis certainly bear this out. The best brands in the British market are Gruyère's First Swiss and Edelweiss. Dr Baginsky and others have undertaken laborious investigations on this pure condensed milk, with the general result that these preparations are honestly what they pretend to be, and must be considered in point of nutritive value far superior to the sweetened varieties. Nevertheless, there are also many objections to the unreserved use of these preparations. When diluted with from four to seven parts of water, as directed, the unsweetened milk is not generally well digested by children. In order to ensure good digestion, it requires in my experience even more dilution than the sweetened varieties, thus reducing the nutritive ingredients below their proper proportion. Another objection to its use is, that it is a much more perishable article than the sweetened variety, which is preserved from decomposition for a long time by the large quantity of cane sugar it contains. Great care should be taken in using unsweetened milk to see, by smelling and tasting, that it is quite fresh before using. Dr Baginsky has shown conclusively that the very high temperature it is subjected to in condensation undoubtedly alters to some extent its composition, by causing certain changes in the proteid and fatty elements. Goblez and Hoppe Seyler have also made experiments on this subject, and show that during the process of condensation there is a decomposition of the lecithin and nucleine, two nitrogenous bodies containing phosphoric acid. These substances, it would appear, are liable to be split up by great heat, the lecithin forming stearic and glycrophosphoric acids. These changes would seem to favour the separation from the milk, or rather the precipitation, of the earthy salts, which interferes with its nutritious quality in proportion as it occurs. Having made experiments with several of the brands of unsweetened milk, I have found in them all more or less precipitation of the earthy salts, as evidenced by a gritty deposit on the addition of water. My experience of unsweetened condensed milk leads me to believe that it is a much more nutritive food when it can be obtained fresh than the sweetened variety. In order to ensure digestion in a young infant, it requires large dilution, and the addition of some fresh cream and sugar, or wheat

phosphates ; so treated, I believe it is only second in value to fresh cow's milk. As in the case of the sweetened variety, the practice of rearing children upon it, simply largely diluted with water, generally in proportion of from one to ten, to one to twenty parts, must be condemned on scientific grounds. It appears to me a very grave question for us, as medical practitioners, to consider how far ill-health, constitutional depravity, and tendency to diseases of nutrition, such as rachitis, are favoured by the present haphazard and somewhat unscientific way in which children, especially those of the working classes, are reared. Undoubtedly many children who apparently thrive on these imperfect methods during the period of artificial lactation afterwards fall a prey very readily to diseases of nutrition and other maladies. The enormous mortality of children during the earlier periods of life is well known, and it is admitted that this is largely due to improper nourishment, more particularly feeding with starchy foods. It is a question whether considerable harm results from the careless use of cow's milk during infancy. Is there not, I would ask, a likelihood that this great mortality would be lessened were a little more attention given to the subject of artificial rearing, and more care taken in regard to the teachings of physiological chemistry, however imperfect, in these matters ?

Time will not permit me, nor do I intend, to discuss the value of the numerous infant foods now in the market. Their name is legion, a sufficient proof that none of them have sufficiently answered the purpose for which they were intended. Many of them are prepared with great care and even scientific accuracy, and form useful additions to cow's milk, especially during the later months of lactation. Some of them are prepared on the principle of Liebig, whereby the farina is changed into dextrine and grape sugar by the addition of malt. Others combine this with milk, as in Gerber's and Nestle's. The most recent addition to the stock, and one likely to prove useful, is Mellin's milk food, or lacto-glycose. In this food wheaten flour, broken malt, and bicarbonate of potash is treated with fresh cow's milk, and heated to 150°, whereby the whole of the starch is transformed into grape sugar ; the whole is then evaporated in vacuo. When dissolved in the proportion of one tablespoonful to half a pint of water, it forms a pleasant food, which is readily taken by infants.

I would sum up in the following conclusions :—

1. Mother's milk being the natural food of the infant during the period of lactation, the best substitute for it ought to contain the various elements of nutrition in like proportion, combined in such a manner as to suit the digestion of the infant.

2. The discrepant results of the quantitative analysis of woman's milk in regard to the proteid and saccharine elements still leaves us without an accurate standard from which we can prepare, as nearly as possible, a physiologically perfect food for infants.

3. As a result of practical experience, fresh cow's milk, suitably treated, so as to ensure the quantity of nutritive ingredients in the relative proportions as they exist in human milk, is the best artificial food for infants.

4. It is necessary that cow's milk be absolutely fresh. As in towns this is not always attainable, boiling is a ready means of retarding decomposition and destroying any deleterious contamination which may exist in the milk.

5. The practice of rearing children on milk simply diluted with water, or lime water with a little sugar added, gives a food deficient in fatty and mineral ingredients, and cannot be considered physiologically a proper substitute for mother's milk.

6. When fresh milk cannot be obtained, or when the sample is of doubtful freshness, so often the case in large towns, condensed milk is a good substitute, and the unsweetened milk, when perfectly fresh, is preferable to the sweetened varieties. These preparations must be properly diluted and otherwise treated, on the same principles as fresh cow's milk.

7. The various infant's foods in the market must be considered inferior to fresh or condensed milk suitably treated. Many of them are injurious to the child. Those varieties which are made with milk, such as Gerber's, Nestle's, and Mellin's, are probably the best substitutes for cow's milk, fresh or condensed, yet introduced.

Dr James Young had enjoyed the paper very much. The question of infant feeding was becoming a much vexed one, as year by year fewer mothers seemed able or willing to nurse their children. He was inclined to think this aversion to nursing was quite as much a result of fashion as of anything else. He himself had tried everything. He usually employs cow's milk. He had been much annoyed lately in certain cases where he had employed condensed milk, both German and Swiss, by the constant sickness of the infants. In one case especially everything was vomited; in another, convulsions followed over-feeding with condensed milk. These fits ceased as soon as the child was put on cow's milk. He had lately tried with good effect cow's milk, with an equal bulk of water, and with a small quantity of Scott's oatflour. This seemed to agree well with children from four to five months old. He had no hesitation in saying, as the result of a long experience, that cow's milk was safer than the condensed milk, and was to be preferred as a general rule.

Dr Leith Napier highly appreciated the paper of Dr Carmichael. There must, however, often be differences of opinion on such a question, and he would like to make some remarks on some points raised. He might mention, in the first place, that he had recently had described to him an apparatus and method for removing from milk the peculiar taste attributed to the feeding of cows on turnips. This rectification of turnip-tasted milk was a matter of much

importance in relation to the feeding of infants in towns. There seemed to be, however, some difference of opinion as to the real cause of the peculiar taste, which the milk of cows fed on turnips sometimes possesses. There is an opinion that a good deal of the effect on the milk depends on the nature of the soil on which the turnips have been grown. He had an impression that the feeding of children on boiled milk, so strongly recommended in the paper, was apt to develop an unsafe astringency in the alimentary canal; and he thought it would certainly be advisable to vary such a mode of feeding on this account. He entirely disagreed with Dr Carmichael in reference to the question of the dilution of the cow's milk. He had often seen children, who had been brought up for some time on the breast, do well when fed on pure cow's milk; and he certainly questions the wisdom of adopting the standard of dilution advocated in the paper. He was disappointed to find no reference to the important question of feeding children of certain types on goat's and other milk. He does not think that children, after three months, thrive well on milk diluted with an equal amount of water. He is of opinion that after three months children will digest almost anything, and certainly that they are capable of digesting much more than we give them credit for. He has accordingly been in the habit of recommending the use of oatmeal, or some of the other foods suitable for infants, after the third month, and has invariably had every reason to be satisfied with this practice—finding that, when given with proper attention, they always do well, and the children thrive remarkably. He would like to refer to one other point, as being one of first importance, and that is, the danger of allowing nurses to get into the habit of feeding a child whenever it may be thirsty or commence to cry. He is convinced that nothing is more objectionable and more certain to disturb the child's digestive organs. They should be fed at regular intervals, and nothing but plain water should be given at other times. He would also like to mention the importance of white wine whey in the nursery, and its value in assisting the digestion of weakly infants. He considered its judicious use as of the highest value.

Dr James Ritchie felt that the Society was much indebted to Dr Carmichael for the able way in which he had presented the subject, and for the interest of the points raised. He had no doubt that Dr Carmichael had before him the importance of the *means* of feeding. This he regarded of much importance, and considered scrupulous cleanliness in the feeding apparatus of the greatest consequence. On this account he invariably recommends the employment of the old boat-shaped bottle, which, being free of all long rubber or glass connexions, can be easily kept absolutely clean. He also laid the greatest stress on the regularity of feeding. He believed that much of the success depends on attention to this. He would beg leave to object to Dr Carmichael's

sweeping accusation of empiricism in the matter of feeding, as he believed that a very large number of practitioners based their practice in this matter on rules derived from wide experience, gained by observation of experiments made for them in nature's own laboratory—the stomach of the infant. As to the food for infants, he prefers to use one cow's milk, if there is reason to be satisfied with the health of the animal and with the quality of the milk. Apart from such assurance he recommends good average milk. He fails to see the use of diluting the milk with water, as, when introduced into the stomach, the whole of the water will be absorbed, and the milk will be raised to its original strength. He considers it important that the milk should be boiled and mixed with such a substance as barley water, or a decoction of Scott's oatflour, not with the view of making the food more nutritious, but because he believes that the particles of the flour open out the curd, and render it more easily acted on by the gastric juice. Lime water he uses when the bowels tend to be relaxed, rice water when they are not so, and barley water or oatmeal gruel when constipation exists. He avoids oatmeal when there is acidity and nettlerash. As regards condensed milk, one cannot tell beforehand whether it will agree with a child or not; but he certainly is of opinion that the amount of dilution necessary is a strong objection to its employment as a substitute for mother's or cow's milk. He was surprised to observe from Dr Carmichael's tables that oatmeal contained only 90 parts of proteids as compared with wheat, which contained 125. He had always been of opinion that the special value of oatmeal was due to its richness in flesh-forming material.

Dr Foulis said that each one was apt to speak from his individual experience. After twelve years of practice, he was able to say that he had never yet seen a child die from malnutrition. He always begins to feed with cow's milk, one part to three. He makes it a rule to boil the milk, and as a diluent he employs barley water. He agrees with Dr Ritchie as to the chief value of the barley water, namely, that the particles of the barley enter the curd, and render the latter more digestible. He is impressed with the importance of avoiding feeding too frequently. If a child is fed half an hour before its proper time, a risk is run of serious intestinal disturbance. Such irregularity occurring now and again is certain to lead to digestive derangement, and sooner or later regular and persistent vomiting will set in. He was much struck with the recommendation to employ farinaceous food at so early a period as three months. Such a practice was directly contrary to the opinions of physiologists, who have long since concluded that the saliva is not active until some considerable time after this age. He had found that the teeth of children fed on Swiss condensed milk are always well developed, and this is directly against the opinion that such children are rachitic. Boiling

water should always be employed to dilute the milk, in order to destroy any fungi, which undoubtedly are apt on occasion to develop in Swiss milk. We often find thrush developing in children fed on condensed milk, and he had no doubt this would be avoided by adopting the precaution he advised. He always employs the diluent in the form of barley water. In cases of persistent vomiting avoid pressing the administration of food. Rather try to give the stomach rest; and we can often do this, and at the same time relieve the irritation, and restore a condition tolerant of food, by the use of hot water in teaspoonfuls only. This will often allay vomiting, and restore the normal state of the organ. He is of opinion that sugar is a most important article of food to children, as we often find children doing well for a time at least, and thriving on sugar and water alone. After three months he has found useful a modification of "Liebig's malted food," consisting of the following:—One breakfast-cupful of milk, two of water, one tablespoonful of crushed malt, one of seconds of flour, and a little sugar boiled together for five minutes and then strained. The presence of the malt acts chiefly by inducing a healthy condition of the fæcal discharges, and he can speak in the highest terms of the value of this food. But, on the whole, as much depends on the method of giving the food as on its nature.

Dr Craig, considering the lateness of the hour to which the discussion has extended, could only say a few words, but must enter his protest against the doctrine that infants under three months cannot digest farinaceous food. He believes that this opinion is a purely theoretical one, and does not meet with a particle of confirmation in practice. It has been his custom to order that infants be fed from the very first day of their lives on a certain quantity of such food, and he prefers for ordinary cases bread steeped in water with a certain amount of sugar added. He has found such practice attended with the best results, and from an extended experience maintains that the ordinarily accepted views are entirely erroneous.

Dr P. A. Young has employed the food referred to by Dr Foulis, and can confirm his opinion of its value. As a rule, he has found that Swiss milk agrees better with children partially nursed by the mother than cow's milk, and prefers it on this account. He should like to enter his protest against Dr Napier's opinion that white wine whey was of great importance in the nursery, and he should be sorry to think that such a view should go out as the opinion of the Society.

Dr Underhill regarded it as most satisfactory that this important question should have been so well threshed out by the Society. It seemed to him that most of the speakers had shown that they had been acting up to the rules laid down by Dr Carmichael in his paper. He himself agrees in the main with the practice laid down by Dr Ritchie. He usually begins with diluted cow's milk, reducing the

dilution as the child gets older. For such dilution he prefers barley water. He is certainly of opinion that much of the illness we meet with in infants is due more to the mode of giving the food than to its nature. He has employed Swiss milk with excellent results up to three months, when he begins to give food, and he is surprised to see from Dr Carmichael's tables how closely Swiss milk diluted with seven parts of water corresponds to the analysis of mother's milk by Meigs. This agreement only confirms him in the use of this substance in certain cases, those in which ordinary cow's milk does not agree. The chief fault of this milk is that it is too rich in fat-forming constituents, and deficient in proteids. He was sure the Society was greatly indebted to Dr Carmichael for his interesting and valuable communication.

Dr Carmichael, in reply, said that the main object he had in bringing the subject of Infant Feeding before the Society was, he felt, fully attained by the valuable expression of opinion which had been elicited in the remarks of the various Fellows who had taken part in the discussion. He thanked Dr James Young for his kind criticism of the paper, and was glad to find, as the result of his long experience, that good fresh cow's milk seemed in his opinion, in the great majority of cases, to be the best form of artificial food for the child. He had purposely omitted any allusion to the milk of goats or other animals mentioned by Dr Leith Napier, as in large towns the difficulty of obtaining any other but cow's milk was insuperable. He admitted the value of goat's and ass's milk in certain cases when they could be procured, as often was the case in country practice. His experience regarding the digestibility of undiluted cow's milk in young infants did not coincide with that of Dr Napier. He felt sure that dilution favoured digestibility, but he quite admitted that after the age of three months some children did digest the undiluted milk. He was glad to find Dr Ritchie agreed with him as to the superiority of the old feeding bottle over that so much in use. The former was more easily kept clean, and insured the attention of the nurse during feeding. The latter seemed to him to be more adapted for the convenience of the nurse than the welfare of the baby. He was pleased to learn that both Dr Ritchie and Dr Foulis, as well as other Fellows of the Society, could testify to the value of mixing barley or other farinaceous decoctions with the milk in many cases. It not only added materially to the nutritive value, but also to the digestibility of the food. In regard to Dr Craig's remarks on the feeding of infants from the very earliest period on solid food along with the breast or the bottle, he thought it a most unsafe principle to lay down. We could not get over the fact that nature has taught us that "milk" was the proper food "for babes," and that their stomachs, during the first three months at all events, were physiologically unfitted for the digestion of solid food in any quantity. He admitted that strong, healthy children did thrive in spite of the spoon food which was admin-

istered, but this was no reason why one should ignore the teachings of physiology in this matter, and he had always felt as a teacher, that on no reasonable scientific grounds could he justify such a practice to his pupils. He begged to thank the Society for the kindly reception given to his paper.

MEETING VIII.—MAY 13, 1885.

Dr J. CONNEL, *President, in the Chair.*

I. *Dr Buist* showed (1.) TRIPLETS, two girls and one boy, two months of age. The parents were Russian Jews. (2.) PLACENTA from a case of twins. The children were both boys. The first was born before Dr Buist's arrival, and he was informed by the nurse that the cord was twisted several times round the child's neck. The patient was placed under chloroform, and the second child was delivered by the feet. The placentæ are separate, being joined at one part by membrane only. The amnia are also separate. The deciduæ came away easily *en masse*. The patient made a good recovery, but the children died, one on the 13th, the other on the 17th day.

II. *Dr Barbour* exhibited a series of PHOTOGRAPHS presented to the Society by Dr Neugebauer of Warsaw, one set being cases of spondylolisthesis, and the other illustrating the use and action of Dr Neugebauer's speculum.

III. *Dr James Ritchie* showed several specimens of MILK CURD. He stated that at the last meeting of the Society, during the discussion on Dr Carmichael's valuable paper, the President (Dr Underhill) asked whether any one had seen experimentally produced out of the stomach the curding of milk mixed with gruels. Dr Ritchie, after going home, had curded milk under various conditions, and he had found the results so interesting, and in some cases so unexpected, that he thought the Fellows might like to see such specimens, even although the experiments are very crude and not to be compared with what we see done for us by nature in the stomach of the child. All the specimens of milk had, after mixture with various substances, been treated in the same way, viz., they were heated to 98°·0, a small quantity of common salt was added, then essence of rennet, the mixtures were stirred, then left in the water-bath at about 98°·0 for half an hour. After some hours the curd was broken down, and when the whey separated it was filtered off. Pure milk showed a very hard curd in large masses. The dilution with water causes the curd to be considerably softer, and specimens

diluted with an equal part of water show a softer curd than those which had only a third of water added. The acidulation of the milk and water with 0·02 per cent. of dilute hydrochloric acid causes the curd to be much harder. If therefore a child's stomach in an irritable condition secrete very acid gastric juice, the curd of milk and water will be a hard one. The addition of farinaceous gruels (oatmeals, barley water, and rice water) in the proportion of one-third causes the curd to be in small soft flakes, and it is very noticeable that if such mixtures be acidulated, the curd is not much harder. The effect of boiling the milk is very marked,—the curd is in very small soft flakes, so small that it is difficult to remove the whey. But when boiled milk is acidulated, the curd is much firmer than that produced in acidulated specimens having gruels added. The addition of one-third of lime-water causes the curd to be in small soft flakes, not so soft, however, as those produced in boiled milk. And it is worthy of note that a very hard curd is produced in milk with one-third of lime-water, if it be rendered faintly acid. The curd of mother's milk is very soft and in small flakes. The amount of essence of rennet added to the specimens of cow's milk caused them to have an acid reaction to litmus paper, but a larger proportion had to be added to mother's milk before the acid reaction was obtained. These specimens confirm the results obtained in practice, viz., the measure of advantage gained by dilution of the milk, the great benefit of boiling it, the marked improvement in quality of the curd, if it be kept open by mechanical means, as by the addition of gruels or of lime-water. But they show that this benefit is lost in the case of lime-water mixtures if much acid is present, and that under such conditions a softer curd is obtained by mixture with gruels than by boiling only, or by addition of lime-water only.

IV. *Mr Skene Keith* showed (1.) A DOUBLE HÆMATO-SALPINX from the following case:—Mrs B., age 30, was sent from Glasgow. There had been profuse uterine hæmorrhage for seven weeks before operation, and for that time she had been unable to be out of bed. Both tubes were greatly distended with blood, and along with the ovaries were closely adherent low down in the pelvis. In addition the pouch of Douglas was filled with old blood clot, which had to be sponged out. Although patient was very weak she recovered with little trouble, and went home on the 21st day. Instead of sponging out the clots, this case might have been treated by washing out the peritoneum with warm water and by draining, as I saw Mr Lawson Tait do in a somewhat similar case a fortnight ago. (2.) A HYDATID MOLE.

V. *Dr Angus Macdonald* showed (1.) A CONGENITAL DEFORMITY OF THE DUODENUM, removed post-mortem from an infant. There was complete occlusion of the alimentary canal below the entrance

of the bile duct. (2.) SECTION OF UTERUS FROM PORRO-MÜLLER OPERATION, the subject of his paper. (3.) FIBRO-DERMOID TUMOUR OF THE RIGHT OVARY, supposed to be a fibroid tumour during life, removed from the same case post-mortem.

VI. *Dr Foulis* demonstrated a MODE OF READILY OBTAINING THE FIBRINOUS DEPOSIT IN ASCITIC FLUID, with the view to render certain and easy the diagnosis between ovarian and ascitic fluids. The method consists in suspending a soft cotton thread in a bottle containing the fluid to be examined. In the course of a very short time the precipitate forms in the spaces in the thread in the case of ascitic fluid, and can be readily recognized under the microscope, Dr Foulis claims that this method of examination is both expeditious and absolutely correct when taken with the microscopic examination of the deposit in the fluid.

VII. A CASE OF URETHROCELE.

By Mr SKENE KEITH, M.B., C.M., F.R.C.S.E.

A DESCRIPTION of the following case will be of interest, in the first place, because the condition is not described in any book in the English language, with the exception of that of Dr Skene on *Diseases of the Bladder and Urethra*, nor have there been more than two or three cases recorded in British Medical periodicals, and besides, the patient whose case I am about to narrate was seen by several members of this, and also of the Obstetrical Society of London, and none of these gentlemen had evidently seen such a case before. I had been present when Dr Thomas operated on an almost identical case in New York, and having this experience, the diagnosis of the case operated on by Dr Keith was evident, almost at a glance.

Mrs S., aged 44, a big, stout lady, had been married at 22. She had two children at intervals of sixteen months, and for six years after the birth of the last was perfectly well. In 1872, after the birth of another child, she was annoyed by the occasional involuntary passage of her water when she coughed or sneezed. A son was born in 1874, another in 1875, delivered with forceps, another in 1877, and the last in 1879. All the children had very large heads. From 1872 until she became pregnant with the last, the urinary trouble continued to get worse, and Mrs S. had often to get up in the night to pass water. During the whole of the last pregnancy, and ever since, the patient's condition was most lamentable. The uterus could only be kept inside the vagina by a large ring pessary; there was constant pelvic pain, and for a period, extending over more than four years, there had never been one night in which she had not been compelled to get up to empty the bladder at least five times,

and usually much oftener. During the day she considered that she was fairly well if she did not have to micturate oftener than once every hour. For a long time there had been some pus and blood mixed with the urine.

In April of last year Mrs S. consulted Dr Keith, and the local condition was found to be as follows:—There was no perinæum; the uterus was large, and the os came down to the introitus vaginæ whenever the ring pessary was taken out; the wall of the urethra was enormously thickened, and projected considerably downwards. The base of the bladder was felt to be quite healthy. The passage of a catheter caused severe pain, and before its point entered the bladder some thick pus flowed from it. The urine was quite clear. The skin surrounding the vulva was red and sore, for although patient was most particular, and washed and dried the parts many times a day, a little pus, constantly oozing from the orifice of the urethra, kept the skin moist and irritated. Dr Keith considered that the condition of the urethra was possibly due to its posterior wall having been pressed outwards by the large heads of the children, and as this condition was kept up by the loss of support due to the absence of all trace of a perinæum, he thought that it would be best to make a large, firm perineal body, which would press the dilated urethra upwards and forwards, and thus obliterate the pouch, which was constantly full of pus. The perinæum was repaired in April, but did not do what was expected. It simply supported the uterus, and took away a good deal of the pelvic pain. It became evident that the urethra itself would have to be attacked. Dr Keith cut down, in the middle line, on a sound which had been passed into the bottom of the pouch, and made a large opening into the urethra. The wall was fully 1¼ inches thick, and the opening was made large enough to admit one finger easily. A large amount of pus came away when the incision was made. The lining membrane of the urethra was rough and of a dark purplish colour. The mucous membrane of the urethra and vagina were sewed together to prevent too rapid closing of the wound. There was not a very great amount of hæmorrhage. From the first night patient became more comfortable; of course control over the bladder was not lost, as the incision did not reach back to the neck.

After four months, all pus and irritation having disappeared, the opening into the urethra, which, in spite of the original stitching together of the mucous membranes, was hardly larger than the point of an ordinary catheter, was closed with twelve horse hair sutures. The patient got up on the day after the operation. The stitches were removed on the ninth day, and she now sleeps the whole night through without having to get up, and during the day requires to micturate two or three times only. In addition, all pain is now gone.

There was not the slightest doubt that the urethra alone was diseased and prolapsed. When the uterus was not supported by a

pessary, and lay almost outside the vagina, there was naturally some lowering of the bladder, but there was no condition at all approaching to cystocele; and when the uterus was properly supported, the slight sinking of the bladder was removed. This did not, however, have the smallest effect on the swelling of the urethra. That remained, no matter what the position of the other pelvic viscera was. Direct pressure lessened the size of the swelling slightly by emptying the pouch. In most of the cases which have been operated upon, an oval piece of the urethra has been cut out, and the parts stitched together at once. When the lining membrane of the urethra has not become diseased, this is, without doubt, the proper method to adopt. In a case such as that of Mrs S., such a plan would probably not have been successful. By making a dependent opening, and thus preventing the retention of pus and ammoniacal urine, the urethra soon returned to its normal healthy condition, in the same way as a diseased bladder will become healthy after a vesico-vaginal fistula has been properly made to cure cystitis, the only difference being that a patient with an opening in the base of her bladder is always uncomfortable and disagreeable to her friends. With an opening into the urethra she is uncomfortable only when making water, as the labia minora are then not in a position to perform "the most modest of the uses ascribed to them."

Professor Simpson said that the case was quite new to him, and he had been much interested in it. He was, of course, acquainted with cystic conditions in the urethra, but this was an entirely different condition.

Dr Macdonald also expressed his interest in the case, as its features were novel to him.

VIII. NOTE ON A CASE OF TRIPLETS.

By J. B. Buist, M.D., F.R.C.P. Ed.

Mr President and Gentlemen,—Cases of triplets in which all the children survive are so extremely rare, that I think the following case is worthy of being recorded:—

R. S., æt. 31, wife of a Polish Jew, has had three boys, two alive, aged 13 and 11 years, and a third, born six years ago, who only lived six weeks. She is a short, stout woman, and her former labours have been easy. Her immense size during gestation had been subject of remark, and it was expected that she would bear twins. Neither in her own nor in her husband's family was there any history of plural births having occurred.

On the 8th March 1885, about 6 P.M., I was called to see her, and on examination found that the membranes were ruptured, and the os was the size of a crown piece and dilatable. The head presented in the L.O.P. diameter. The pains were regular and

good, so that in half an hour the first stage was nearly complete. The pains now commenced to flag, and the patient complained much of their severity and of loss of strength, and begged to have chloroform. Seeing that the labour could be easily terminated, I commenced its administration about 6·50 P.M. At 7 P.M. I applied the forceps, and delivered a female child without difficulty. Its small size struck me as remarkable, and on passing my hand over the patient's abdomen I at once found that scarcely any diminution in her size had taken place, and that in all probability there were two more children. After placing a double ligature on the cord and separating the child, I found that the uterus was well contracted over its contents. On again examining, a second bag of membranes was felt. Passing my hand into the uterus, I immediately ruptured the membranes, and grasped the head of a second child, which I drew down and engaged in the brim in the L.O.A. diameter. The forceps were again put on, and the delivery of a female child completed with ease. The umbilical cord in this case was so short, that it was with some difficulty a double ligature could be placed upon it. Passing my left hand over the abdomen once more, the outline of a third child was easily made out; and after finding that the uterus continued to contract, I again introduced my hand into the uterus, and failing to rupture the membranes, I grasped a foot through them, when they were easily broken, and the delivery of a male child at once completed. In this case the cord was of considerable length, and the child was the largest of the three. The whole of the above proceedings only occupied a quarter of an hour. By subsequent gentle pressure over the uterus, the whole of the deciduæ were expelled *en masse* in twenty minutes. There was scarcely any hæmorrhage, and a well-padded binder was at once applied, and a dose of ergot administered.

Mrs S. made a very good recovery, but for a few days she suffered severely from after-pains. All three children on 12th May are alive and well. One month after birth No. I. measured 17½ inches, weight 4 lbs. 2 oz.; No. II. measured 18 inches, weight 4 lbs. 12 oz.; No. III. measured 19 inches, weight 5 lbs. 3 oz.

Description of Deciduæ.—Weight 2 lbs. 13 oz. On examination of the uterine surface, there were two distinct placentæ, a larger with two cords, and a smaller with one cord. The larger corresponds to the two females, the smaller to the male child. The two placentæ are connected together by membrane, from 1 to 2 inches in width. The larger mass is irregularly quadrilateral, and is divided by a longitudinal groove into two unequal parts, 12 × 8 in. and 9 × 7 in. The smaller mass is crescentic, 7 × 4 in.

Membranes.—The chorion forms a continuous envelope for the three amniotic sacs. It dips between the sac of the male and the female sacs. Apparently it does not dip between the two female sacs, their amniotic membranes being in close apposition; but on

close inspection a small amount of chorion connective tissue can be distinguished.

Umbilical Cords.—No. I., length 13 inches, with 3 inches velamentous insertion at margin of double placenta. No. II., length 14 inches, with normal insertion. There is a "kink" or twist on this cord 4 inches from the placenta. No. III., length 24 inches, with 1½ inches velamentous insertion into the margin of the small placenta. The vessels to the small placenta do not pass into the larger. The vessels through both cords to the large placenta intermix freely.

Remarks.—This case is unique in my experience. Cases of triplets occur only once in between 7000 and 8000 labours, so that it rarely happens that accoucheurs have the good fortune to see them. Frequently one or more of the children are still-born, and in many cases they only survive for a few hours. Curiously enough, plural births occur most frequently in Russia; and it is worthy of remark that the father and mother of these infants had emigrated to this country from Russian Poland.

Their length and weight are also remarkable. The least length of a fœtus at full term is 17 inches, while its least weight is 2 lbs. 6 oz., while the average length is 19 inches, and the average weight is 6 lbs. 11 oz. We thus see that they are all nearly up to the average in length; and although they are below the average in weight, they are considerably heavier than the least recorded weight of a fœtus at full time. The combined weight of the children and placentæ was 16 lbs. 14 oz.; and if the weight of the amniotic fluid be added, the total weight of the uterine contents must have exceeded 20 lbs.

The case is also interesting from the ease and rapidity with which the delivery was accomplished, the interval between each child being only five minutes. I have since asked myself whether it was quite safe to proceed so rapidly, and whether the danger from hæmorrhage was not thereby increased. It appears to me on consideration to be the safest practice to empty the uterus at once when an anæsthetic has been given. We thus avoid bad effects from the prolonged administration of chloroform given without special preparation, and the tendency to uterine inertia which in such cases it might aggravate or induce.

Dr Foulis was naturally much interested in the question as to the origin of triplets. The point of interest was as to what was the developmental condition that gives rise to one fœtus in one case and to several in another. In observations made some time ago he had frequently come across ova containing 2 to 6 germinal vesicles, and he believed that this feature of the ovum was taken to explain the occurrence of pleural conceptions. He would like to know how many choria there were in this case.

The President mentioned one case where a woman had twins,

and the wives of her husband's two sons by a former marriage had also twins.

Dr Angus Macdonald had only once attended triplets, an account of which he read some years ago to the Society. In this case two of the placentæ were connected and the other was detached. Two of the children are still alive, the other being still-born. He had calculated in his paper that the uterine contents before their birth could not have weighed less than 21 lbs. This case was further curious in that there occurred at the fourth month uterine hæmorrhage of a most severe character,—much more severe than he had ever seen present without abortion supervening. As to the matter of the origin of plural conceptions, he doubted if the general opinion coincided with Dr Foulis's view that these arose in all cases from a single ovum with several germinal vesicles. It is quite common to find twins in separate choria, indicating that they were the result of separate ova, and in cases where the amnion is common at birth it is probable that it might be explained by the separate amnion having given way at an earlier period. Spaeth has made several important observations as to the relation between size, sex, etc. When twins are from the same ovum they are of the same sex, the placentæ are found to anastomose, the children are of similar size, and the common characteristics continue when they grow up. When they are produced from separate ova the differences are often very marked,—they often being of separate sexes, with entirely separate placentæ, and of very diverse sizes. In this case of Dr Buist's it would seem as if one, at least, was developed from a separate ovum.

Professor Simpson was of opinion that Spaeth's observations do not always hold good as to the necessary similarity of twins derived from same ovum. It has been suggested that the most marked cases of similarity, as to sex and physical and mental characters, are to be found in those cases where the germinal area gets divided, and the two halves develop each a fœtus. His impression in this case was that two of the children were produced from a single ovum with divided area, and the other from a separate ovum. He was glad Dr Buist had noted the case so carefully.

Dr Underhill mentioned the case of three girls (triplets), who used to attend the Sick Children's Hospital. They were all well developed and healthy.

Dr Buist, in reply, thanked the Fellows for their reception of his paper. He had avoided referring to the question of development, as he regarded this as being more a matter for the study of experts.

IX. CASE OF PORRO-MÜLLER OPERATION IN A LABOUR OBSTRUCTED BY A LARGE DERMOID TUMOUR ADHERENT TO THE POSTERIOR ASPECT OF THE BRIM OF THE PELVIS.

By Angus Macdonald, M.D., F.R.C.P. Ed., F.R.S.E.; Physician and Clinical Lecturer on the Diseases of Women, Royal Infirmary; Lecturer on Midwifery and Diseases of Women and Children, Medical School, Edinburgh.

The patient, Mrs A., æt. 27, and five years married, was for several years under the care of Dr Spence of Burntisland. She was under treatment for menorrhagia in the beginning of 1881, when the tumour, which led to the difficulty on the present occasion, was first observed by Dr Spence.

In December 1881 the patient had a miscarriage about the end of the fourth month of utero-gestation. The fœtus then expelled had been dead for about ten days. It was expelled along with its placenta from the uterus before Dr Spence's arrival. The fœtus was markedly flattened—more so than could have been expected to arise from the obstruction of the uterine tumour, which at that time did not appear great.

Recovery was excellent. Mrs A.'s health continued good till the summer of 1883, when abortion again occurred about the end of the third month. In this case the ovum was expelled *en masse*, the membranes only being ruptured.

The tumour was decidedly larger than in 1881. Recovery was good. During the last pregnancy nothing abnormal was noticed by the patient. When Dr Spence first saw her, which was during the eighth month, he observed that the fundus was unusually high placed, and that the abdominal distension was specially great.

The patient began to experience slight pains on the 28th of February 1885. These continued at wide intervals during the next day. But the pains did not set in regularly till about 8 P.M., when they became severe. They continued powerful for about five hours, and then became feeble and ineffective. Dr Spence found the pelvis obstructed posteriorly by a large rounded mass, which reduced its capacity very greatly. As, however, on the occasion when the patient first miscarried, he found the tumour movable, he hoped in the course of the labour that this time also it might get displaced. It could not be pushed up, however; and on the following morning I was telegraphed for to go to Burntisland to see the case. That day being Sunday, I could not get over the Firth till 1 o'clock P.M.

Accompanied by Dr Brewis, we having taken along with us all the instruments likely to be needed, either for craniotomy or abdominal section, I arrived there about 2 o'clock. I found the patient rather exhausted; the fœtus could be made out lying in

the abdomen in front of the tumour; head presenting, but projecting over the front of the symphysis, and resting upon a solid mass posteriorly, which reached as high as the umbilicus. This tumour we fancied to be a fibroid growing from the posterior wall. The uterus was made by this mass to project very high up, and the tumour was specially elongated in consequence. The fœtal heart could be heard, but it was very slow and rather feeble. Per vaginam, the whole of the inlet of the pelvis posteriorly was occupied by a hard, firm, immovable mass, apparently a fibroid in the lower segment of the uterus. The available conjugate was less than two finger breadths. The cervix could be felt with great difficulty high up behind the symphysis: it was fairly well dilated, soft, and occupied by an oblong bag of membranes, the head not entering it. The presenting part could be just touched behind the bag of membranes. After consultation, seeing that no form of craniotomy was possible, it was agreed to perform the Cæsarean section, as otherwise both mother and child must inevitably be lost. We also agreed to adopt the Porro-Müller method. The facts of the case were laid before both the husband and the patient, who agreed to the procedure proposed. Accordingly, the operation was performed with strict antiseptic precautions, but without the spray. The temporary ligature employed was a caoutchouc tube, and worked well. There was no bleeding when the uterus was incised. The operation was easy, except for two points: 1st, the right ovary was adherent, low down to the surface of the tumour, and flattened over its surface, so that it had to be ligatured separately and removed; owing to the nature of the attachment of the ovary this was particularly difficult; 2nd, the stump in its back part was attached over a large extent to the immovable tumour; this rendered it very difficult to include the mass in a clamp. The Lawson Tait's clamp, which we had brought with us, could not be applied. In our efforts to put it on, the temporary ligature slipped, and gave rise to some bleeding, which was, however, quickly arrested. The stump was eventually secured in a strong, twisted, wire loop, and retained outside by pins. Much trouble was experienced in keeping the bladder out of the way. The abdomen was sponged clean from some blood which had entered it, and the wound brought together, the stump being in its lower angle. A portion of protective was laid over the wound, and over this and the stump iodoform was freely powdered; and, finally, a salicylic wool dressing was bandaged over the abdomen, and an injection of ℥ij. of whisky administered. The child, which was a well-formed, full-time female, breathed and cried lustily as soon as she was removed from the uterus. The operation, in consequence of the difficulties above mentioned, lasted one hour and twenty minutes. At 6.40 P.M. the temp. was 97°·8; pulse 138. ¼ gr. morphia was given hypodermically, as pain was complained of in the pedicle. At 7.5, after seeing her baby, the patient went

to sleep, and continued sleeping at intervals till 5 A.M. She then had no pain; pulse 128; temp. 98°·4. At 8.15 temp. 102°·4; pulse 140; respirations 32. Three ounces of urine were drawn off at 10.55; temp. 101°; pulse 120; respirations 36. Had a teaspoonful of whisky. At 1.35 A.M. temp. 102°·6; pulse 96; respirations 36. A teaspoonful of whisky was administered; slight delirium. At 6.15 A.M. there was hæmatemesis for an hour, and an involuntary stool passed. The patient died at 6.50 A.M., being twelve hours after the operation.

Sectio forty hours after death, conducted by Dr Spence and Dr Veitch. No redness of margins of wound, which were adherent throughout; parietal peritoneum slightly adherent to surface of tumour. No peritonitis; slight sub-peritoneal ecchymosis on the anterior abdominal wall. Cavity of peritoneum quite free from blood and effusion, and all abdominal organs compact and healthy. Other organs not examined.

Dr Spence was kind enough to send the tumour over to me, and its examination, while it has thrown a flood of light upon the case, has revealed the fact that we had not to deal with a fibroid tumour, as Dr Spence and I supposed, but with a nearly completely solid ovarian tumour, which was not a fibroid, but a dermoid. What I removed of the right ovary must, therefore, have been only a part of that organ, the rest having been degenerated and changed into the tumour.

The size of the mass, though still considerable, gives only an imperfect idea of its original bulk, as it has largely shrunk in all its dimensions, and the cyst in its posterior wall has been emptied. It would appear in settling down that the tumour had twisted the right broad ligament half a turn as it fell backwards across the pelvic inlet.

The uterus with its contained membranes has been inspected by Dr Barbour, who has taken a transverse slice out of the middle of it to make sections, one of which he has presented to me, and which I now show you. In consequence of this about $\frac{3}{4}$ of an inch has been removed, but still the preparation shows very well the original appearance of the mass, and also bears further evidence in favour of Dr Barbour's view that the uniform contraction of its uterine attachment is not the only agent in separating the placenta. Though this uterus is considerably contracted, no trace of separation between it and the placenta can be seen on the closest scrutiny.

The enormous size of the uterine sinuses is shown in the specimen, some of which sinuses measure $\frac{3}{4}$ of an inch across.

It would appear that this poor woman died of the shock of operation, superadded to the exhaustion of a severe labour, as no other cause could be found to account for her death.

The resultless labour of 16 hours must of itself have greatly reduced the patient's vital force, and rendered her more liable to

succumb to the operation. In consequence of the several difficulties above mentioned, the operation was also more prolonged than we would have wished.

The parts removed at post-mortem examination consist of the—1. Stump, with remains of broad ligaments; 2. A portion of the bladder; 3. The cervix, with a small portion of the posterior wall of the vagina; 4. The tumour.

1. *Description of the Stump.*—The stump is tightly embraced in a wire clamp at a distance of about an inch below its cut surface, and piercing it immediately above the wire are two pins crossing each other at right angles. Also encircling the stump in a position between the wire and the pins is a silk ligature passing three times round. On either side of the stump the cut ends of the broad ligaments are included in the grasp of the wire, those of the left side being caught in the twists of the ends of the wire and twisted correspondingly.

On the anterior surface of the stump is seen the peritoneum passing down underneath the wire clamp on to the posterior upper surface of the bladder. On the posterior surface of the stump adhesions take the place of the peritoneum. The cut surface of the stump has a diameter of about 2 inches, and is divided into an anterior and posterior portion by the uterine cavity, which admits the points of two fingers. The anterior portion measures in an antero-posterior direction barely ½ an inch. The posterior measures an inch.

2. *Bladder.*—In front and towards the left side of the stump is a portion of the bladder, half an inch above the upper limit of which the wire clamp passes. Neither the ureters nor urethral openings into the bladder can be recognised in the preparation. They seem to have been cut off at the post-mortem examination.

3. *Cervix.*—Behind the bladder is seen the cervical cavity widely dilated; behind this there is left a small portion of the posterior wall of the vagina, from the posterior surface of which strong adhesions can be seen running into the tumour.

4. *Description of the Tumour.*—A portion of the right broad ligament, which appears to have undergone a half turn rotation from left to right posteriorly, is attached to the tumour on its right posterior aspect. Where it is combined with the tumour is a fresh surface round which a ligature was placed, and from which the ovary had been removed as described in the operation.

The tumour is of an irregularly oval shape, with one side nearly straight, viz., that turned towards the pedicle. It measures 6½ inches long by 4½ in depth and 2½ from before backwards. It is connected to the stump by what appears to be a broad thick adhesion. In the posterior aspect of the tumour is a large cyst 5½ in. long by 3½ in. broad, portions of the inner walls of which are studded with osseous masses. On the anterior wall of the cyst are some tough cartilaginous looking expansions. On incising the tumour the great mass of it appears to the naked eye to be

made up of fibro-myomatous material. The tumour has not yet been examined microscopically.

There can be no difference of opinion in regard to the necessity of adopting some kind of Cæsarean section in this case, as no power on earth could have reached the head to open it, even though it had been possible to extract the body of the child through the inlet. But it was not so. Regarding the propriety of selecting this particular operation in the circumstances I am, I confess, not without some misgivings. Looking at the situation of the child in the upper and anterior part of the uterus, it appears to me now that I could have more easily and safely performed the ordinary Cæsarean section with Sänger's improvement, as I could have done that without touching any part of the tumour. The removal of the child and fixation of the temporary ligature gave no trouble, and the operation promised to be rapid and easy. But the curiously elongated slope of the pedicle, and the way in which its posterior part, *i.e.*, the adhesions, ran into the fixed tumour on the right, made it impossible to fix Lawson Tait's clamp upon it. By an unfortunate coincidence both the wire clamps which I possess happened to be on patients in the Infirmary. The day being Sunday I could not get another easily, and thought Lawson Tait's would do. The wire loop would have been much more easily applied.

Again, had I performed the ordinary Cæsarean section, I should not have concerned myself with the removal of the ovaries.

This would have saved much time, as what I believed to be the right ovary was very difficult to get completely away, owing to its exceeding close relation to the tumour. Of course, examination of the tumour now explains how this difficulty arose, and what was the real state of affairs. But during the operation this could not be made out. On the other hand, to perform a Porro-Müller and leave any part of the ovary behind would have, of necessity, exposed the patient to the risk of continued growth in what I believed to be a fibroid, which was left, and thus in a great measure have stultified our efforts.

I am not certain, further, but it had been better had I sewed the ends of the stump together with catgut, and then sewed the peritoneum over it, and dropped the pedicle into the abdomen.

Altogether the case is disappointing, and considering the hitherto experience of the operation in Scotland, disheartening. In 152 cases of true Porro's operation, *i.e.*, discarding all laparotomies for removal of the fœtus from the abdomen, except when the uterus was unruptured and the pregnancy at its natural end, the mortality of the mothers is 85, *i.e.*, about 56 per cent. So far as I know only four Porro's operations have as yet been recorded in Scotland. Two of these were conducted by Professor Simpson, one of which I had the opportunity, through his kindness, to witness; the third is the present one; and a fourth was performed in Glasgow by Dr William Muir for malacosteon.

In all these cases the women have died. In my case the only white point is that the child was saved. As it was simply impossible to have delivered the woman otherwise, one has the consolation that something important was gained. In the same number of cases tabulated by Dr Godson, the children were alive in 98 cases, or 65 per cent., which is a considerable improvement in the results effected by the old operation.

The rapidity with which the child, the moment it was brought through the uterus, breathed and cried is a fact against the argument used by some to account for the frequent death of children in precipitate labours, that the death is owing to the too rapid change from intrauterine to extrauterine life.

Professor Simpson had listened with much interest to the record of this case. Such cases are so rare that everyone is of interest, and each will teach us something. Dr Truzzie, of Milan, assistant to Porro, has recently published a paper in which he defines Porro's operation more accurately; and he would deny the right of this operation to be regarded as a true case of Porro's operation. He claims that the results of the operation when carried out, as directed by Porro, are 37 per cent., as against 56 per cent. by the other methods. Dr Simpson was, however, of opinion that the operation, as performed by Dr Macdonald, was the one most calculated to give the patient the best chance. He has not yet a clear idea of the value of Sänger's modification, but thinks it best to let the uterus drain through the abdominal wound. Each case must, however, be judged on its own merits, and the method modified accordingly; and probably Dr Macdonald's view as to the value of Sänger's modification in this case was the correct one. He could easily see the difficulty of dealing with the stump; and probably the pressure on the stump had something to do with the death, both in Dr Macdonald's case and in his own also.

Dr Underhill felt indebted to Dr Macdonald for the interesting account of this rare case, and its record was none the less valuable from its being unsuccessful. He remembers a case mentioned by Spiegelberg, in which a similar condition existed. The operation adopted was the Cæsarean, but the patient also died. A good drawing of the post-mortem condition was given. In the Maternity Hospital the other day a case occurred in which labour was obstructed by a tumour. This filled up the pelvis, and was attached to the sacrum. The os was narrowed to a mere slit. The tumour contained fluid, and was supposed to be ovarian. Dr Keiller aspirated and drew off 13 ounces of pus, and then turned and delivered a living child without difficulty. The patient had been in bed for some time suffering from what was called inflammation, and at the time of the operation the temperature was 102°.

Mr Skene Keith asked whether Thomas's operation might not

have been done with success in this case. It seemed to him a suitable case, so far as he could make out. He was of opinion that this operation was much neglected. It was a comparatively easy operation, and he thought that it offered a good chance of success in such cases.

Dr Leith Napier was also of opinion that Thomas's operation should be considered in these cases. He saw a case recently in consultation in which labour was obstructed by a fibroid tumour. The case had been first diagnosed as one of locked twins. Ultimately the labour was accomplished successfully by pushing up the tumour and application of forceps.

Dr Barbour was glad to find that the tumour was not a fibroid, as were it of this nature, it would materially affect some points he was studying with regard to the placental site. Dr Macdonald has drawn attention to the fact that there are some spaces like commencing separation between the placenta and uterus. Those are really veins, some of them $\frac{3}{4}$ in. in diameter. He wished to direct attention to the fact of the difference between the thickness of the upper and lower portions of the anterior uterine wall. The lower part of this wall is much thinner than the upper, and this seemed important as bearing on the question of rupture if it could be shown that this was a usual condition. The lower part of the anterior wall was recognised as the most usual seat of rupture, and this anatomical condition may contribute to this occurrence.

Dr Macdonald, in reply, pointed out that the Porro-Müller operation was still on its trial, and that it was only after a certain amount of experience, which time would bring, that its claim to supersede the old Cæsarean operation could be determined.

Meeting IX.—May 27, 1885.

Dr David Wilson, *Vice-President, in the Chair.*

I. *Dr Felkin* showed (1.) Professor Kehrer's SPOON for conveying air to the child during the delivery of the after-coming head. (2.) A new form of NEEDLE WITH SPLIT EYE, which does not require threading in the ordinary way. (3.) Professor Ahlfeld's OBSTETRIC ROLL.

II. *Mr Skene Keith* showed a HOME-MADE GUTTAPERCHA RING PESSARY, which had been removed from a vagina after a sojourn of sixteen years; also an OVARIAN TUMOUR with peculiar brain-like contents.

III. NOTES ON A CASE OF ALEXANDER-ADAMS' OPERATION.

By Alexander James Sinclair, M.D., F.R.C.P. Ed.

The accumulated testimony of many observers as to the value of an operation is of great importance. It is by such collective evidence that the utility of treatment in disease can be tested and reduced to its true value. One's own bantling is too apt to be looked at through the rose-tinted spectacles of its originator. Let this be my apology for placing before you short notes on a case of prolapsus uteri, treated by the method of shortening the round ligaments of the uterus.

E. F., æt. 46, married when 29. Has had two children and one miscarriage. Menopause occurred at 44. Her first confinement was of a tedious character, necessitating the use of instruments. Shortly after rising she noticed that her womb came down on the slightest exertion. She is unable to remember how many days after delivery she rose from bed—but it was doubtless after the usual short period that women of the poorer and labouring classes resume their domestic duties. She is not aware of her perinæum being torn, and she now presents no evidence of such having been produced. She was recommended to wear a pessary, but was unable from want of pecuniary means to do so. She had always suffered much inconvenience from constipation, and had considerable pain when the womb protruded beyond the vulva.

Admitted to City Parish Infirmary on 20th January 1885. On examination per vaginam the cervix uteri was found to have undergone atrophy. The os uteri was small, contracted, roughened, and bled when touched. There was a considerable leucorrhœal discharge. She was desired to keep her bed and use a vaginal douche of warm water and alum.

On the 29th, with the assistance of Drs Haultain and Irving, I performed the operation for shortening the round ligaments. I shall not trouble you with the details of this operation. A full and admirable description of it will be found in Dr Alexander's monograph.[1] One point I may draw your attention to, as a means of facilitating the operation after making the incision through the skin—feel with your finger for the external abdominal ring. The external ring cannot always be felt through the skin, but after the skin has been cut no difficulty is experienced in ascertaining its exact position. The ligaments were drawn out to the extent of an inch and a half. Two strong silver wire sutures were applied at upper edge of wounds on both sides. They included the skin, fascia, pillars of ring, and ligaments. These sutures were fastened by twisting, and the ends left somewhat long. The rest of the wounds were closed

[1] *Shortening of Round Ligaments.* By W. Alexander.

with silk-gut. A ring pessary was introduced, and the surfaces of wounds covered with protective and gauze. Considerable tension at site of wound existed for four days—the abdominal wall being deeply drawn in at these points. The temperature rose to 102° F. on the evening of third day, when it gradually fell, and was normal on the eighth day after operation. The catheter required to be used for seven days. Urine was then passed, although with some pain and difficulty. On the seventh day one of the wire and all the gut sutures were removed. The remaining wire suture was slackened. On the 11th day it also was removed. Sixteen days after the operation the wounds were healed, and the patient was allowed to rise from bed. Thirty-four days after the operation the pessary was removed. The patient was looking well and going about the ward. She stated that she felt lighter and better than she had done for years. She could pass urine and fæces without difficulty or pain. There had been no leucorrhœa since the operation. She was seen by me on the 23rd May, when she expressed herself as being able to do her ordinary duties. There was no return of prolapse.

Remarks.—Of the benefit derived from the operation there can be no doubt in this case. The steps of the operation presented no peculiar difficulty, and it was a bloodless one. One can hardly believe that such a simple operation was not thought of at an earlier date. It seems to me that the probable cause may have partly arisen from the term ligament being applied to these uterine appendages. Now, anatomically, we know that the structure of the ligament consists chiefly of muscle fibres identical with those of the uterus, mingled with many of the striated variety, and that these cells undergo hypertrophy and multiplication during pregnancy in the same manner as those of the uterus. These ligaments, or rather muscles, are attached by three origins to—(1), the tendons of internal oblique and transversalis, near symphysis pubes; (2), to outer pillar of ring; and (3), to inner pillar of ring. They pass backwards and outwards, becoming fleshy in front of epigastric artery, and behind the lower border of internal oblique and transversalis. They get between the layers of the broad ligaments of uterus, and finally are inserted into the anterior and superior part of that organ. In the dog, sheep, and cow, these ligaments pass upwards or forwards, and are attached to the aponeurosis of last rib. M. Velpeau,[1] Maygriers,[2] and later still Mr Rainey,[3] who has written a minute description of their structure, believed that these ligaments contract during sexual intercourse, and by elongating and narrowing the upper part of vagina tend to facilitate the entrance of semen into the uterus. I cannot myself understand how the drawing away of os uteri and elonga-

[1] *Anatomie Chirurgicale*, 1833, vol. ii.
[2] *Nouvelles démonstrations d'accouchements*, p. 62.
[3] *Philosophical Transactions*, 1850.

tion of vagina can facilitate the entrance of the seminal fluid. I should rather imagine the opposite to be the result. That these cords contract during labour I have frequently verified. They can be felt most readily during the third stage of labour, as hard thick cords drawing the fundus uteri towards the pubes, and probably checking the tendency to prolapse of the uterus, by maintaining it in the axis of the brim of pelvis. I cannot help thinking it is by replacing and maintaining the uterus in the normal position of slight anteversion that this operation for prolapse acts beneficially.

There was one other point that struck me forcibly during the treatment, and that was the little or no apparent benefit derived from the use of the pessary. The tension to the abdominal walls was not relieved. I believe the stretching of the upper part of the vagina in its transverse diameter may even have increased the traction on the cords. I shall certainly in any future operation endeavour to do without a pessary, or use one which will not cause distension of the vaginal walls, but will directly support the uterus, and at the same time assist the action of the ligaments by stretching the vagina in its longitudinal diameter.

Dr Halliday Croom had listened with much pleasure to Dr Sinclair's paper. He congratulated him on the exceedingly satisfactory results of his operation. He was of opinion that the operation goes a long way to enable us to relieve many cases of displacement, which, with previous methods of treatment, must be considered well-nigh hopeless. He was, however, surprised to find that Dr Sinclair considered the operation so easy a one. He himself had performed the operation in one case, and he was bound to confess that he had the very greatest difficulty in finding the end of the ligament. He was sure that the operation occupied quite an hour,—the greater part of which time was consumed in seeking for the ligament. So long, indeed, did the first stage of the operation require that he did not feel justified in completing the operation by shortening the ligament on the other side. The patient lay for some weeks, during which time a great deal of pus escaped from the wound; but at the end of a month she was discharged with the retroversion almost perfectly cured, and the bad symptoms entirely removed. Probably, however, increased experience would enable the operation to be accomplished more quickly, and he certainly was of opinion that the operation was one which, if properly performed, would yield the best results.

Mr Skene Keith agreed with Dr Croom's remarks about the difficulty experienced in finding the ends of the ligaments. In the one case he had operated on, the operation lasted nearly an hour and a half. The patient had suffered from symptoms due to retroversion for eleven years. After the operation she was kept in bed for five weeks until the wounds healed. The uterus

was found to be slightly anteverted nine weeks after; but two weeks after that the old pains and sickness came back, and the sound passed backwards with almost as marked a curve as before operation. The uterus has now been fixed to the abdominal wall. Mr Keith asked why the ligaments should not stretch again after the operation, if the original displacing cause were not removed. He felt doubtful whether the operation would ever come to be a very common one, on account, not only of the risk of failure, but also from other risks which had followed, and from the long time the wounds often were in healing.

Dr David Smart, though he had been ten months resident in a Liverpool hospital, had never had the pleasure of seeing Dr Alexander operate. He mentioned one case which had come under his observation in which the symptoms seemed to present a favourable indication for operation. Dr Alexander was to have been asked to shorten the round ligaments. Owing to different circumstances the operation was deferred, and the patient ultimately did well, and made a complete recovery under the use of the hot-water douche, and a suitable pessary.

Dr Sinclair was much obliged for Dr Halliday Croom's and Dr Keith's observations. Of course, his paper only related one case, and it was, perhaps, premature to draw conclusions; but the result seemed to him so satisfactory, that he regarded it as worthy of record. It seemed to him that much stress ought to be laid on the proper selection of suitable cases. This case seemed to him one of peculiar suitability, as the uterus was light and extremely mobile. He certainly had no difficulty whatever in getting the round ligaments. He considered that the careful examination of the position of the ring through the skin incision was an important point. The ring could scarcely be felt until the skin was cut, but the moment that was done, the ring could be made out without any difficulty; and it seemed to him of much importance that this should be done always before proceeding with the deeper dissection.

IV. *Dr Halliday Croom* presented the

REPORT OF THE ROYAL MATERNITY AND SIMPSON MEMORIAL HOSPITAL, FOR THE QUARTER ENDING 31ST OCTOBER 1884.

By FRANK W. A. GODFREY, M.B., Resident Physician to the Hospital; late Resident Surgeon, Royal Infirmary.

DURING the three months ending 31st October there were 53 intern and 188 extern cases.

INTERN CASES.

Of the 53 women delivered in the Hospital, 28 were primiparæ, 25 multiparæ.

The numbers were as follows:—i.-para, 28; ii.-paræ, 11; iii.-paræ, 5; iv.-paræ, 2; v.-paræ, 1; vi.-paræ, 2; viii.-paræ, 1; ix.-paræ, 1; x.-paræ, 1; xiii.-paræ, 1.

Average age of primiparæ, 22¾ (oldest 30, youngest 17); of multiparæ, 27½ (oldest 42, youngest 19). 53 children were born —33 males, 20 females. The primiparæ gave birth to 18 males, 10 females; the multiparæ to 13 males, 12 females. There were two cases of premature labour at the 7½th month.

Average Duration of Labour.—In primiparæ: 1st stage, 11½ hours; 2nd stage, 2 h. 5 m.; 3rd stage, 18 m. The longest being—1st stage, 39 h.; 2nd stage, 1 h. 40 m.; 3rd stage, 30 m. The shortest —1st stage, 4 h.; 2nd stage, 1 h.; 3rd stage, 15 m. In multiparæ: 1st stage, 9½ h.; 2nd stage, 1 h. 17 m. 20 secs.; 3rd stage, 12 m. Longest—1st stage, 22 h.; 2nd stage, 20 m.; 3rd stage, 23 m. Shortest—1st stage, 2½ h.; 2nd stage, 35 m.; 3rd stage, 3 m. This does not include the street birth afterwards alluded to.

The labours are classified as follows:—natural, 36; laborious, 11; preternatural, 3; complex, 2; premature, 2; precipitate, 1. The vertex presented on 49 occasions as follows:—L.O.A., 36 times; R.O.A., 8 times; R.O.P., 5 times; L.O.P., 0. In two cases the occiput remained posterior; in the remaining R.O.P. cases the position became R.O.A. This rotation took place at different levels in the pelvis in different patients. In one specially interesting case the rotation took place very high up, when flexion was but slightly marked, where the head lay not in the oblique diameter, but rather to one side of the pelvis, and when the occiput had apparently already begun to turn into the hollow of the sacrum. The patient was a multipara, with a roomy pelvis, but the head was of full size. In two cases of persistent R.O.P., forceps had to be applied to complete delivery.

Three Preternatural Labours took place.—These were two breech cases and one transverse. The positions were L.S.A., R.S.A., and L.A.A. In one breech case the child was premature, at the 7½ month. In the other the child was lost through delay in delivery of the head; the arms became extended above the head; the pubic arm was jammed behind the occiput, and was only brought down after great difficulty; the head also was large. The transverse case was delivered by podalic version by Dr Hart, and the child saved.

There were 11 *Laborious (or Instrumental) Labours*, these not including some cases of slightly protracted labours, which were concluded naturally.

Forceps were applied 8 times: high, 1; low, 7.

High Forceps Case.—Once for flat pelvis in a primipara.

Low Forceps Cases.—Twice for persistent occipito-posterior; once for eclampsia; twice for rigidity of perinæum, with inertia; once for large well-ossified head, with rigidity of perinæum; once for commencing inertia in a multipara.

Cranioclasm.—1 case.

Two Complex Labours.—One post-partum hæmorrhage, occurring a full hour after the expulsion of the placenta.

Eclampsia.—A primipara, aged 21, who during the latter months of pregnancy had suffered from great œdema of the legs, and some of the face and body, went into labour early on 4th October. The pains became strong and regular as the day went on, but the os dilated slowly. Patient was very restless and excitable. At 8 P.M. the pains became very strong, and she had a violent fit of eclampsia. The os was then almost fully dilated, the membranes unruptured, the head L.O.A. and well engaged. The rectum was empty, the skin acting freely; the urine was drawn off, and found to be heavily loaded with albumen; no blood or tube casts. Chloroform was given, the membranes ruptured, and the child delivered with forceps. No further fits occurred. Diaphoresis was kept up by extract of pilocarpin; and chloral and bromide of potassium were administered for 36 hours. Carbolic douche, 1–80, was used instead of corrosive sublimate. The albumen had quite disappeared from the urine on the third day, and patient made an uninterrupted recovery.

The Precipitate Labour occurred in a multipara, who was delivered on the Dalkeith Road in three pains. When admitted she was in a narcotised condition from alcohol, which had been given her after delivery. She had walked far and fasted long.

Mortality.—Maternal, 0; fœtal, 4. Breech case; two dead in uterus; 1 cranioclasm; infantile, 2, immaturity.

Average Weight of Children.—Primiparæ: female, 7 lbs. 6 oz.; heaviest, 8 lbs. 6 oz. Male, 6 lbs. 15½ oz.; heaviest, 9 lbs. 4 oz. Multiparæ: female, 7 lbs. 10¼ oz.; heaviest, 10 lbs. Male, 7 lbs. 7½ oz.; heaviest, 8 lbs. 8 oz.

Average Length of Cord.—Males, 22¼ in.; females, 21⅓ in. Longest, 30 in.; shortest, 14½ in.

Ophthalmia neonatorum was developed in 6 cases. In 4 of these it was slight, and yielded readily to treatment; but in the other 2 cases it was obstinate and severe. During the last six weeks of the quarter the eyes were systematically washed after birth with 1-2000 corrosive sublimate solution, and no more cases of ophthalmia occurred.

The Perinæum was lacerated on six occasions: once in a multipara (natural labour), and five times in primiparæ, two of which were forceps deliveries. In 2 cases the tear extended to the sphincter, once through the sphincter but not into the rectum, and the remaining cases were of the first degree. On each occasion the tear was sewn up immediately after labour; and in every case, with one exception, primary and perfect union took place. In one case, where the tear extended to the sphincter, there was retention of urine for twelve days, requiring the use of the catheter. The stitches were removed on the tenth day.

Ergotin was only used three times during the quarter in patients in whom there was reason to fear post-partum hæmorrhage. In them it was not given until the placenta was separated.

Unilateral Facial Paralysis as the result of forceps was observed in two children delivered in the Hospital, and in two children in the extern practice. In each case it passed off completely in within three days.

Puerperium.—Of the 53 women delivered, all completed the puerperium without any abnormal symptoms. There were, of course, the usual slight rises of pulse and temperature due to mammary and other unimportant disturbances; but throughout the quarter there was not one single case which gave cause for anxiety. The lochia were fœtid in only one case, and that, strangely enough, was the only case in which carbolic acid solution (1-80) was used for douching. The patient had albuminuria, and on that account corrosive sublimate was not used. The highest temperature recorded was 104·8 in a patient suffering from cracked nipples, in whom mammary abscess threatened. Under treatment the temperature fell in 36 hours to normal.

During the month of August there was a peculiar and unaccountable run of sub-normal temperatures. Whether this was due to the corrosive sublimate or to the diet is a question. There were no other symptoms of mercurial poisoning, and the same solution (1-2000) was used all through the quarter. With an improved dietary during September and October the phenomenon was not observed.

Careful antiseptic treatment was carried out all through the quarter. Hands, instruments, etc., were cleansed in 1-1000 corrosive sublimate solution; 1-500 corrosive in vaseline was used for anointing the fingers; and the vagina was douched twice daily throughout the puerperium with 1-2000 corrosive sublimate solution.

The following case calls for special remark:—

Case of Cranioclasm owing to Thickness and Undilatability of Cervix.

Mrs N., æt. 24, iii.-para, admitted 22nd October, and delivered the same day.

Patient was admitted at 5 A.M. At 4.30 A.M. she had been standing at a neighbour's door when the waters escaped suddenly and without pains. She was at her full time, but there had been no indication of labour before the membranes ruptured. She had had no pains before admission, and felt none till 7 A.M., two and a half hours after rupture of the membranes.

Previous Obstetrical History.—Two still-born children, five and two years ago; the second premature at the eighth month. Both labours prolonged, but not instrumental.

Examination on Admission.—Large and apparently well-formed woman. Abdomen symmetrically enlarged to size of full-term pregnancy; walls tense. On palpation, fundus three fingers' breadth below ensiform, slightly to the right. Fœtal head freely movable at the brim; back to the left and forwards, limbs to the right. Fœtal movements marked, and heart in first position.

Per Vaginam.—Vagina fairly roomy, cool, and moist; perinæum partly deficient; cervix soft, cool, and high up; os the size of a shilling and dilatable; membranes ruptured; head high and quite unengaged in the first position. The diagonal conjugate diameter was apparently somewhat lessened, but no very careful examination of the pelvis was made at that time. Patient was put on her back, and a binder tightly applied for two hours, and opium administered. At the end of that time the os had dilated to the size of a florin; the head was still unengaged. Chloroform being given, artificial dilatation of the cervix by means of Barnes's bags was then performed till the os was the size of a wine glass; and high forceps (axis-traction) were applied by Dr Croom. No great difficulty was experienced in their application. After forcible traction the head was brought to engage; but the cervix refused to dilate further, and threatened to tear over the blades of the instrument. The forceps were accordingly removed, and the patient left for two hours; chloral being administered during that time. She was seen again at 1.30 P.M.; there was no change in the cervix, which remained particularly tense and firm. For that reason forceps were *not* again immediately applied, but further dilatation was attempted with Barnes's bags, and patient was seen again at 4 P.M., when the head was found to have receded above the brim, and the cervix to be thick, tense, and firm as before. It came to be a question whether forceps should be again applied or version attempted; but owing to the fact that the waters had drained away for twelve hours, and to the hard unyielding condition of the cervix, it was decided to reapply the forceps. Accordingly, the axis-traction forceps were again applied, and traction made with as much force as was thought prudent, but all attempts to drag the head through the hard, and by this time œdematous cervix, were futile. It was resolved, therefore, rather than run the risk of a deep laceration, to open the head, which was accordingly done with the ordinary perforator, and delivery effected with the cranioclast. The puerperium was uncomplicated, and the patient left the hospital on the 11th day post-partum. Examination then revealed a pelvis slightly lessened in the cavity and at the outlet.

Extern Cases.

There were 188 women delivered. Primiparæ, 34; multiparæ, 154. 175 children were born—Males, 100; females, 75.

The labours were classified as follows:—Natural, 143;

laborious, 16; preternatural, 5; complex, 8; abortions, 13. Of the vertex presentations the positions were:—L.O.A., 151; R.O.P., 10; R.O.A., 5; L.O.P., 0. In three cases the position was not ascertained. The face presented once, R.M.A.

The *Preternatural Labours* were:—5 breech cases; L.S.A., 2; unascertained, 3. In one, assistance was not sent for till the body was born, and when the student arrived the child was dead, the head being still in the cavity.

There were 6 *Premature Labours*,—1 in a flat pelvis, afterwards referred to; 2 cases of twins at the 7½ and 8th month; 1 at the 8th month, hydramnios; and 1 at the 8th month, no definite cause.

The *Laborious Labours* were 14 forceps, 1 version in flat pelvis, 1 version in twins, and 1 cephalotripsy for hydrocephalus.

Forceps were applied 14 times; high 6, low 7, as follows:—High—3 times for pendulous belly in multiparæ; once for prolapse of the cord in flat pelvis; twice for rigid cervix, with inertia. Low—once for masculine pelvis; four times for rigid perinæum, with inertia; twice for inertia from prolonged 2nd stage.

Complex Labours were—Twins, 3 cases; post-partum hæmorrhage, 2 cases, one due to alcohol, the other to morbidly adherent placenta; both did well.

Abortions.—1 at 6th week, 1 at 2nd month, 5 at 3rd month, 1 at 4th month, 1 at 5th month, 1 at 5½th month, 1 at 6th month. One bad case almost proved fatal from excessive hæmorrhage; and one at 4½ month was clearly due to placenta prævia.

In all instrumental deliveries careful douching was carried out for the first three days of the puerperium. One bad case of pelvic peritonitis following natural labour, which terminated favourably, was reported; as well as three other cases of pelvic inflammation of minor degree.

Mortality.—Maternal, 0; fœtal, 31. Abortions and premature labours, 19; full term, 12—1 cephalotripsy, 1 prolapsus funis, 3 compression of cord, 7 no definite cause. Infantile, 4 — immaturity, 2; malnutrition, 2.

The following cases of special interest occurred in the extern practice:—

Cephalotripsy for Hydrocephalus and Flat Pelvis.

Mrs B., aged 19, i.-para, went into labour on 27th August. When first seen, she had been in labour twelve hours, and the membranes had been ruptured 3½ hours. She was very restless and excited; pains strong and frequent.

On examination by palpation a very large head could be felt, freely movable at the brim; back of child to the left, and forwards; breech at fundus. No fœtal heart could be heard. Per vaginam, parts cool and moist; os the size of a small tumbler,

soft, cool, and dilatable. Cervix not thinned out; head high and quite unengaged, very large, and lying in the transverse diameter of the brim; flexion was very slight; a large open fontanelle could be felt to the left, and a still larger one to the right. There was great overriding of the parietal bones during the pains; between the pains the sagittal suture was felt widely open. The diagonal conjugate diameter at the brim measured $3\frac{3}{4}$ inches. Chloroform was administered, the head perforated, and after high forceps had been applied in vain, it was then crushed and extracted with Braxton Hicks' cephalotribe. Its delivery was easily accomplished, and the placenta came away naturally a few minutes later. The vagina was carefully douched with 1-2000 corrosive sublimate solution before and after delivery.

The body of the child was puny, shrivelled, and ill nourished. The father was aged 18, and phthisical. The mother made an uncomplicated and rapid recovery.

Premature Labour in a Flat Pelvis.

Mrs C., aged 35, v.-para, delivered 1st September. *Previous Obstetrical History.* — Four previous pregnancies; two went to full term, and on each occasion craniotomy was performed. In the other two premature labour was induced at the seventh month, but the child was dead born each time. On this occasion patient came to the Hospital when five and a half months pregnant for consultation. *Examination.*—Short, thick-set woman, of marked rickety conformation. Abdomen pendulous. Fundus 3 inches above umbilicus. Uterus contains a living child, with head presenting. *P.V.*—Vulva and vagina normal and capacious. Sacrum markedly flat. Diagonal conjugate at brim measures $2\frac{3}{4}$ inches. After careful examination it was decided to again induce premature labour at the seventh month. On 30th August word was brought that the patient was going into labour. She was then six and a half months pregnant. She had been standing about a good deal that and the previous day. The pains were slight, and chiefly in the back. The os was closed. Ordered absolute rest and $\frac{1}{2}$ grain morphia suppository. Next day the pains were stronger, and the os admitted two fingers with difficulty. The pains increased in strength during the day, and at 10 P.M. chloroform was administered, and gradual dilatation of the os with Barnes's bags commenced. Full dilatation was completed with the hand at 11.30. The child was then lying dorso anterior, in the left cephalo iliac position. The cord was pulsating strongly; fœtal movements vigorous. The edge of the placenta was felt about one inch from the margin of the internal os. The membranes were ruptured, and both feet grasped and slowly brought down to the vulva; position R.S.A. The trunk was gradually delivered, chiefly by supra-pubic pressure. The cord was then examined, and found to be pulsating strongly. The arms became

extended, but were freed in the usual way. An attempt was then made to express the head, but failed; pulsation in the cord ceased. A second attempt at expression failed, and the head was then with great difficulty delivered by combined supra-pubic pressure and the Prague seizure. There was a deep depression on the left side of the head at the junction of the temporal, frontal, and parietal bones, and the head was much elongated vertically. The bitemporal diameter engaged in the conjugate, and measured from the bottom of the depression 2¼ inches. No attempt at resuscitation was made, the fœtus being unquestionably dead. The patient made an uninterrupted recovery.

V. REPORT OF THE ROYAL MATERNITY AND SIMPSON MEMORIAL HOSPITAL, FOR THE QUARTER ENDING 31ST JANUARY 1885.

By JOHN WILLIAM BALLANTYNE, M.B. and C.M., Buchanan Scholar for 1883, and THOMAS BROWN DARLING, M.B. and C.M., House-Surgeons.

EXTERN CASES.

The number of cases reported during the quarter was 150, including 4 abortions. Of these 124 were multiparæ, and 26 primiparæ.

Presentations.—Vertex, 127; breech, 1; footling, 1; face, 1; twins, 4 cases (see below); remainder unreported or doubtful.

Sex of Children.—Males, 78; females, 72.

Mortality—

(*a.*) *Maternal,* 2.

(1.) Acute Pleurisy. Confined of a still-born female child. Breech presentation in L.S.A. position, after-coming head extracted manually. Patient had been assaulted by her husband a week previously. Died on day following confinement from acute pleurisy, as certified by Dr Littlejohn.

(2.) Eclampsia. Patient, a primipara of 18 æt., had been unconscious for twenty-four hours, and had had about fifty eclamptic fits when application was made to the Maternity. She was confined of a six months dead fœtus, and died two hours afterwards with symptoms of œdema of the lungs. The urine was highly albuminous. Sphygmographic tracings were taken which will be considered in a special paper.

(*b.*) *Fœtal,* 11.

(*c.*) *Infantile,* 3, all premature, died shortly after birth.

Classification of Labour.—Natural, 129; laborious, 8; preternatural, 1; complex, 8. There were 4 cases of abortion, 2 at the second month, 1 at the third, and 1 at the fifth.

Laborious.—Lingering, 4; instrumental, 4.

Preternatural was a footling.

Complex.—There were 4 cases of twins, the presentations being as follows:—

(1.) Both vertex. (2.) Both breech. (3.) Vertex and breech. In the 4th case the children were born before the arrival of either the student or nurses.

There were 2 cases of eclampsia, (5) one of which proved fatal (see above). In the other (6), a primipara of 24, the patient was at once put under chloroform and delivered by means of forceps. She had a slow but satisfactory puerperium. The child, a well-developed male, did well also. *Vide* paper read before Obstetrical Society on January 14th, 1885.

The remaining complex cases were (7) acute pleurisy, proving fatal (see above); and (8) placenta prævia hæmorrhage in a vii-para, 36. The placenta was nearly central, and the patient very weak from the loss of blood. The cervix was dilated with Barnes's bags, and version performed. Mother and child did well.

Intern Cases.

During the quarter (1st November 1884 to 1st February 1885) the number of cases treated in the Hospital was 69. These were as follows:—i-paræ, 42; ii-paræ, 16; iii-paræ, 4; iv-paræ, 1; v-paræ, 1; vi-paræ, 1; vii-paræ, 2; ix-paræ, 1; x-paræ, 1. Of the total number 15 were married, of these 2 were primiparæ.

Age.—Primiparæ, average 22 years 4 months, oldest 38, youngest 17. Multiparæ, average, 27 years 9 months, oldest 43, youngest 20.

Average Duration of Labour—

Primiparæ.—1st stage, 14 h. 50 m.; 2nd stage, 2 h. 13 m.; 3rd stage, 18 m. Whole labour, 17 h. 21 m.

Multiparæ.—1st stage, 12 h. 56 m.; 2nd stage, 1 h. 37 m.; 3rd stage, 15 m. Whole labour, 14 h. 48 m.

Presentations.—Primiparæ, vertex, 37; brow, 1; breech, 1; delivered outside, 2; abortion, 1. Multiparæ, vertex, 24; shoulder, 1; breech, 1; delivered in cab, 1.

Positions.—Primiparæ, L.O.A., 26; R.O.A., 10; brow, 1; L.S.A., 1; uncertain, 4. Multiparæ, L.O.A., 16; R.O.A., 6; R.O.P., 2; L.S.A., 1; left acromio-anterior, 1; uncertain, 1.

Sex of Children.—Primiparæ gave birth to 21 male and 19 female children; multiparæ to 14 males and 13 females. Full time male children weighed 7 lbs. 7 oz., and measured $18\frac{1}{12}$ in. on average. The full time females weighed 7 lbs. 2 oz., and measured $18\frac{5}{12}$ in. in length on average. The heaviest male child weighed 9 lbs. 9 oz.; the lightest, 5 lbs. 4 oz. The heaviest female weighed 9 lbs. 8 oz., the lightest, 5 lbs. 6 oz. Average weight of the placenta was 1 lb. 9 oz., and the average length of the cord 22·5 in. The heaviest placenta weighed 2 lbs. 12 oz., the lightest, 1 lb. The longest cord measured 42 in., the shortest 13 in.

Premature Labour occurred in 14 cases. Periods—1 at the sixth month, 6 at the seventh month, 5 at the eighth, and 2 doubtful.

Presentations.—Vertex, 9; brow, 1; breech, 2; unascertained, 2.

There was 1 case of abortion in a primipara at the third month —history of syphilis.

Mortality.—(*a.*) Maternal, 1, from eclampsia, to be afterwards referred to.

(*b.*) Infantile, 2, both premature, one died two hours after birth, the other six days.

(*c.*) Fœtal, 12, 8 of which were premature, and generally either putrid or syphilitic; the other 4 were full time, in 1 of which there was partial prolapse of the cord, and in another early rupture of the membranes with transverse presentation. In remaining 2 the cause of death was unascertained.

Classification of Labours.—Natural, 45; laborious, 14; preternatural, 3; complex, 5; (abortion, 1; delivered outside, 1).

Laborious.—9 lingering; 5 instrumental.

Of the lingering, the only one worthy of special note was the case of Mrs F., primipara, æt. 38, L.O.A. On p. v. examination there was found a cystic tumour, about the size of a hen's egg, on the left side of posterior wall of the vagina. This became tense and smooth during each pain, and protruded a little from the vulva. Patient stated that for two months she had felt as if "there were something coming down," and that she had been frequently troubled with a desire to micturate. The catheter on being introduced to the bladder did not communicate with the cyst. Professor Simpson tapped the tumour with an aspirator, but as the fluid was too thick and gelatinous, an incision was made with a bistoury, and the fluid expressed. The vagina was thereafter frequently douched with corros. sub. solut. (1-2000), and no further artificial interference was necessary. The temperature in puerperium never rose to 100°.

Instrumental.—All low forceps.

(1.) Primipara, 22, R.O.A. Inertia utero. Second stage lasted 6½ hours.

(2.) Primipara, 22, L.O.A. Rigidity of soft parts.

(3.) Primipara, 28, L.O.A. Inertia uteri from tedious 1st stage (24 hours).

(4.) Primipara, 23, L.O.A. Incomplete rotation.

(5.) ii-para, 24, R.O.A. Rigidity of perineum and inertia uteri.

State of Perineum.—Rupture took place in 7 cases, of which 4 were primiparæ. In only 1 case was the tear up to the sphincter ani. Carbolized catgut sutures were used in each case, and the parts afterwards dusted with equal parts of iodoform and bismuth. All healed rapidly, with the exception of one where the centre stitch gave way.

Complex Cases: (1) *Eclampsia,* (2) *Mitral Disease.*—The former

of these cases was narrated in full in a paper on "Sphygmographic Tracings in Eclampsia," read before the Obstetrical Society on January 14th, 1885; and the latter case, in which serious mitral disease complicated pregnancy and parturition, and proved fatal to the mother (after her removal to the Royal Infirmary), will be the subject of a communication to be made to the Obstetrical Society at an early date.

(3 and 4.) *Hæmorrhage.*—Were 2 cases closely resembling each other—both primiparæ, 18 and 21 respectively—who on admission were very weak from a hæmorrhagic discharge from the vagina, increased by each pain. In one the edge of the placenta could just be felt through the os. Barnes's bags were used to dilate, and on rupturing the membranes the hæmorrhage ceased in both cases.

(5.) *Phthisis.*—A ii-para of 22 had had a severe cough and copious expectoration for several months before admission. On auscultation, signs were found of the presence of a phthisical cavity in the left apex, and of considerable consolidation of the right apex. During labour she became very weak and almost pulseless, so the parturition was terminated by the use of the axis-traction forceps, and patient was stimulated by ether, etc. Child, female at full time, was still-born. Patient had a satisfactory puerperium, and lung condition remained *in statu quo.* Pulse tracings were taken during the pregnancy, parturition, and puerperium. These will be reported in a special paper.

Puerperium.—In 25 cases the temperature never rose higher than 99°, 30 never higher than 100°, 8 did not reach 101°, 3 not 102°, 2 not 103°, and only 1 reached 105°. This last was in a primipara, æt. 21, of a highly nervous temperament. On the 6th day signs of septicæmia developed, the temperature reaching 105°, and pulse 120. The uterus was douched out with corrosive sublimate solution (1-2000), and xx gr. doses of sodæ salicylate administered, the patient at the same time being isolated. The temperature and pulse were gradually reduced, till on the 9th day they were normal, and all the other signs improved.

Ophthalmia Neonatorum.—During the quarter Credé's prophylactic treatment with a 2 per cent. solution of nitrate of silver was pursued. In four cases ophthalmia occurred, two of which were very slight, and in the other two there was a probable history of syphilis. All improved when washed out daily with nitrate of silver.

Antiseptics.—The antiseptic used was a solution of corrosive sublimate, 1 in 2000, the only objection to its use being its action on instruments, etc., which, therefore, when required, were dipped in carbolic acid, 1 to 20.

Meeting X.—June 10, 1885.

Professor Alexander Russell Simpson *in the Chair.*

I. *Dr Milne Murray* showed an APPARATUS for recording the movements of non-striped muscles, such as the intestine, vagina, uterus, etc., in the lower animals; and also a number of TRACINGS, showing the peristaltic movements of the pregnant and non-pregnant vagina and uterus of rabbits.

II. *Professor Simpson* showed one of Tarnier's COUVEUSE for premature children, containing a child which had been born four days before. The child was born at the seventh month of utero-gestation, labour having been induced by Dr Barbour on account of a dermoid tumour blocking the pelvis. The child was doing well and was sucking vigorously, being nursed by the mother.

III. *Dr James Young* related the following case:—A. B. was born on the 10th of February 1885. The boy was plump and very healthy, and has been nursed by a healthy mother. On the 1st of April, an elder child, while playing with buttons, placed two in the infant's mouth, when the mother, not knowing what had been done, observed something in the mouth and extracted a button, and then "gave the child a drink." Frequent fits of crying occurred during the following weeks, and on the 26th of May I was summoned. The child was in pain, and cried lustily when the stomach was pressed. A sudden fit of vomiting supervened. Neither the mother nor I suspecting the presence of any foreign body, we were glad to find that the infant had ejected a tailor's common button, which had lain in the stomach for two months. Since the 26th of May the infant has been quite well.

IV. FURTHER REPORT OF CASES TREATED IN WARD XXVIII., ROYAL INFIRMARY, from May to November 1884.

By Angus Macdonald, M.D., F.R.C.P. Ed., F.R.S.E., Physician and Clinical Lecturer on the Diseases of Women, Royal Infirmary; Lecturer on Midwifery and Diseases of Women and Children, Medical School, Edinburgh.

Restoration of Perineum.

Case I.—Mrs Y., æt. 35, residing at Elphingstone, was admitted 22nd April 1884, complaining of dragging pain in back, and something coming down. Illness began seven years ago after birth of sixth child. Labour was severe. Since then she has had two children; the last was very large, and after this birth the pain and prolapse became well marked.

Physical Examination. — Perineum absent. Tear extending through sphincter ani. Womb slightly prolapsed.

Treatment.—On 5th May Dr Macdonald stitched up the perineal and rectal tears, using silkworm gut for the former and catgut for the latter. Good union resulted. 28*th May.*—Uterus replaced and kept in position with ring pessary. T bandage applied to support perineum. 31*st May.*—Discharged cured.

Case II.—Mrs M., æt. 37, residing in Texas, was admitted 2nd May 1884. Patient's perineum was torn eight years ago during labour. Five years ago she began to complain of pain in the back, and menorrhagia, which is her present complaint. Since the time her perineum was torn she has had two full-time children and three abortions.

Physical Examination. — Uterus retroverted, large and very tender. Perineum torn nearly to verge of anus.

Treatment.—After being treated with glycerine plugs and hot water injections on account of the uterine condition, on 26th June the perineum was repaired in the usual way. 2*nd July.*—Stitches were removed, when perfect union in lower two-thirds of tear was found to be the result. 20*th July.*—Uterus replaced to normal position, and supported by ring pessary. 24*th July.*—Discharged.

Case III.—Mrs C., æt. 34, admitted 3rd June 1884, complaining of incontinence of fæces. Patient had a child on 25th March 1884; the labour was tedious, and instruments were used. Three days after delivery she noticed that her motions came away in the bed and could not be retained.

Physical Examination.—Perineum absent; tear extending into the rectum.

Treatment.—On 17th June Dr Macdonald performed his usual operation. On the seventh day after operation stitches were removed; perfect union resulted along the whole line of wound. 2*nd July.*—Discharged.

Case IV.—Mrs S., aged 37, residing at Gogar, recommended by Dr Graham, was admitted 6th October 1884, complaining of incontinence of fæces, down-bearing pain, and weakness in the right leg. The patient's illness dates from the birth of her last child, 3½ months ago. Her labour was an instrumental one; the child, a large male; forceps failed to deliver her; craniotomy was resorted to.

Physical Examination.—Perineum torn through its whole extent, the tear extending through the sphincter ani and about half-an-inch of anterior rectal wall. The uterus was retroflexed.

Treatment.—On Monday, 13th October, Dr Macdonald restored the perineum. The rectal tear was first stitched with catgut sutures; then the sides of the perineal tear and a portion of posterior wall of vagina were rawed, and the whole brought together by silkworm gut sutures. 20*th Oct.*—The stitches were removed, when union

was found to have taken place throughout the whole extent of the part operated on, the new perineum being thin, but sufficiently strong. 23*rd Oct.*—Bowels moved. Patient quite able to retain fæces. 31*st Oct.*—Dismissed.

In presenting the brief record of the above four cases of perinæorraphy there does not appear to me to be much room for observation, as the cases explain themselves. As three of them represent severe cases, passing up through the anal sphincter, I think we may congratulate ourselves on a considerable measure of success, as they all healed well. I would take this opportunity to urge upon the members of the Society the advantages presented by silkworm gut as compared with silver wire in this operation. The security is equally good—the increased comfort to the patient is very manifest—and the ease and safety with which they can be removed are also remarkable. But the best method of treatment of such cases is their prevention. I do not think I can do better than urge upon the members of the Society the propriety of sewing up the tear at once in every case of rupture, however serious. Success is then nearly certain, and the results are much more satisfactory than those gained by operation after the parts have shrunk out of position, however skilfully it be performed. No advice is worse than that which used to be given as the routine recommendation, viz., in cases where the tear was moderately severe to sew up at once, and leave very bad cases alone until the patient recovered from her confinement, and then operate. The worst cases, involving extensive tear of the vesico-vaginal septum, give usually most satisfactory results when sewed up at once. In dealing with a tear passing through the sphincter ani some special management is needed. I never now practise the method of tying the deep sutures in these cases in the rectum, as it is rather difficult to cut them out without straining the tender adhesions. I think it is much preferable to follow the method of Bantock, which consists in carefully sewing up the rectal tear in the first place after rawing the surfaces. This part is secured with numerous catgut sutures, care being taken to bring out the needles exactly at the edge of the rectal mucous membrane, and enter it again exactly at the edge of the mucous membrane on the opposite side of the tear. When the sutures are tied, after being passed in this way, the rawed surfaces are accurately brought together without the intervention of any of the rectal mucous membrane, and without admitting a putrescent element in the track of the stitches from the bowel cavity. In this way, also, less rawing of the end of the vagina is needed, as the surfaces brought together after the rectal wound is sewed up form a broad rawed surface posteriorly, which can then be treated as though the sphincter had never been injured. The catgut sutures are cut short and left in the centre of the rawed surfaces.

I never give any medicine either to move the bowels during the time that the stitches are in, or to prevent their moving. One is often astonished to notice in accounts of such cases statements to this effect, that the bowels are kept sealed for a week with opium. If the patient is kept quiet and on fluid food for the week after the operation the bowels almost never give any trouble. I prefer to have the bowels moved by means of a carefully administered enema of castor oil and gruel before the stitches are removed. As to the removal of the stitches much recklessness of statement is frequently made. The stitches undoubtedly give support to the feeble adhesions against undue strain, even when the grip has got relaxed, so that, unless they irritate by their presence, they are better to be left in seven or eight days.

But in some cases they are not well borne, and set up swelling and irritation by the fifth or sixth day, and if left in to the seventh or eighth the entire operation may be spoiled by the adhesions which had formed becoming unhealthy.

Consequently, I watch carefully on and after the fifth day to see whether there is an absence of swelling, of œdema, or of redness. If any such appear I remove the stitches either completely or only such as show irritation. But if those bad symptoms do not appear, I leave the stitches for eight days, or even longer.

Cancer of Cervix.

Case I.—Mrs B., æt. 36, residing at Lasswade, was admitted 9th May 1884, on the recommendation of Dr Allen, complaining of bodily weakness and an offensive discharge from genital passage. Patient's illness began with the birth of her last child, five months before admission, the discharge commencing then and lasting ever since.

Physical Examination.—On the cervix uteri there is a large cauliflower-like polypus, which, when touched, causes a pus-like discharge with an offensive odour.

Treatment.—The day after admission Dr Macdonald removed the tumour and the vaginal portion of cervix by means of the ecraseur and thermo-cautery. Patient made good recovery, and was dismissed on 5th June relieved.

Case II.—Mrs W., æt. 32, residing at North Berwick, was admitted 25th August, 1884, complaining of pain in hypogastric region, and an excessively fœtid discharge from vagina. The discharge first appeared four months before admission. Has had three children, the youngest 10 years ago.

Physical Examination.—The whole of the cervix uteri is converted into a cauliflower excrescence, and extends to within a quarter of an inch of the vulva. A portion of the upper part of

the vagina, near the middle line posteriorly, is in a similar condition.

Treatment.—On 6th September Dr Macdonald, with his fingers and curette, tore away the fungoid mass. A large quantity of dirty greenish soft material was dislodged. Patient was douched with warm carbolic lotion. There was no subsequent hæmorrhage. Patient made excellent recovery, and was dismissed on 18th September relieved.

Case III.—Mrs R., æt. 37, married fourteen years, has had four children, residing at Leith, admitted 17th October 1884, complaining of a badly smelling discharge. Patient noticed that her menstrual discharge increased in May last. About three months before admission she first felt it swelling badly. She suffered little pain.

Physical Examination.—Abdomen rather distended; offensive discharge from vagina. *P. V.*—Vagina occupied by an enormous cauliflower mass, depending from the cervix and bleeding readily.

Treatment.—18*th October.*—The wire of a galvano-cautery was passed round the root of the mass, which was removed by means of it. A small piece growing from lower lip of cervix escaped the wire and was removed by scissors. For a day or two after the operation there was some little discharge and pain, but these soon disappeared, and the patient was discharged relieved on 1st Nov.

Case IV.—Mrs W., æt. 46, readmitted 9th October 1884, complaining of a red discharge from the vagina. This patient had the vaginal portion of the cervix removed for cauliflower excrescence eighteen months ago.

Physical Examination.—9*th Oct.* 1884.—Cervix enormously hypertrophied, ulcerated deeply in the centre.

Treatment.—11*th Oct.*—Dr Macdonald scraped away the ulcerated mass with a long handled gouge, and then applied the thermo-cautery to the bared surface. Very little discharge occurred after the operation, and on 23rd Oct. the discharge had ceased entirely, and she was dismissed relieved on 28th Oct.

The above four cases of cancer of the cervix present average specimens of the nature and tendency of the disease in that region. It will be noticed that the first three had had children. It is within our knowledge that the fourth one also had a family, although it is omitted in the record. This bears out the well-known fact that cancer of the cervix is more common in women who have borne children than in those who have not borne children. It also lends support to the opinion that injuries to the cervix arising during parturition are important etiological factors, predisposing to epithelioma of the cervix. It will be noticed that three of the cases recorded above were examples of the malignant

papilloma, or what is sometimes called cauliflower excrescence. The essential connexion with true carcinoma is seen in case No. IV. For although eighteen months previously a malignant papilloma had been removed from this patient's cervix, it did not return as papilloma, but as ordinary carcinoma of a specially active form. Cauliflower excrescence, if seen early, allows of very complete removal, and is doubtless longer in returning than ordinary epithelioma, but I have never been able to meet with a case in which it did not reappear in the course of two or three years at longest, and when it does so it is in the cicatrix as above observed. For this kind of tumour the incandescent wire is particularly suitable, because it is painless if properly employed, completely arrests hæmorrhage, and destroys a considerable layer of tissue beyond its line of application. It is, however, somewhat difficult to apply and to regulate, especially in regard to the amount of heat and the tension admissible, and I have not been able to see its superiority over other modes of removal in the light that some Continental authorities have placed it. In even the worst cases of cancer considerable good may be accomplished, and the arrest of stinking discharge, as well as the prevention of resorption of putrescent elements, effected by removal of as much as possible of the affected tissue.

An element of relief to pain, as well as diminution of resorption, is sometimes brought about by the means employed to remove the cancerous cervical tissue allowing of the escape of pent-up putrescent mucus in the uterine body. I have observed the escape of a large quantity of horribly stinking material from the cavity of the uterus on more than one occasion during such an operation. I prefer, however, the use of the knife, the gouge, the scissors, and the thermo-cautery in such cervical operations to the use of chloride of zinc, as advocated by the late Dr Marion Sims. The chloride of zinc I found dangerous and difficult to regulate, both in regard to the extent and intensity of its action on the surrounding tissues. There is seldom much bleeding in the removal of cancer of the cervix, and when such does occur it is readily arrested by a few touches of the thermo-cautery. The cautery needs to be introduced through a wooden vaginal speculum. All such operations are of course only palliative, but that they frequently give material relief and considerably prolong life is unquestionable.

Coccygectomy.

Case I.—J. S., aged 18, residing in Forres, was admitted on 19th June 1884, complaining of pain at the tip of the coccyx when sitting. Patient nine months ago first felt an uneasy feeling in the region of the coccyx. Two months before admission the pain got very much worse, being especially severe when she sat down, but not while walking or lying. The patient's brother had

sometimes playfully caught hold of her by the shoulders, and given her what is popularly known as a "knee-rise." This is the only cause she can assign for her present illness. She has been suffering from debility for the last five years.

Physical Examination.—Great pain complained of when the tip of coccyx is pressed on.

Treatment.—25*th June.*—Dr Macdonald, with a tenotomy knife introduced subcutaneously, separated the coccyx from all its attachments. 10*th June.*—On examination it was found that pressure on the coccyx did not cause pain. 19*th July.*—Dismissed. 23*rd Oct.*—The patient returned complaining of the old pain. She states that about a fortnight after dismissal the pain returned. 28*th Oct.*—Dr Macdonald cut down on the coccyx from behind, and removed it at the sacro-coccygeal joint. There was very little hæmorrhage, no vessels requiring to be tied. The wound was stitched with five deep and several superficial catgut sutures, and dressed with iodoform. The patient was kept in bed with her knees tied. 2*nd Nov.*—Deep stitches removed. Wound healed by first intention. 18*th Nov.*—Patient has now very little pain on sitting. 21*st Nov.*—Sent to Convalescent House.

Backward Projection of Coccyx, with Anchylosis of Sacro-Coccygeal Joint.

Case II.—Mrs T., aged 21, admitted on 28th Aug. 1884, complaining of pain at the end of the back bone after sitting, and pain while the bowels are being moved. Her illness dates from the birth of her child, fifteen months before admission. The patient is subject to fits. The urine contains no albumen.

Physical Examination. — Coccyx bent backwards and pain complained of when the tip is pressed by the examining finger.

Treatment.—Rest, hot water injections, and tonics, and blisters applied over the coccygeal region. 9*th Sept.*—Dismissed improved. 26*th Oct.*—Patient returned complaining that the pain is no better. 27*th Oct.*—Dr Macdonald cut down on coccyx, and removed it with bone forceps. The bone was firmly anchylosed and enlarged by inflammatory thickening. There was no bleeding. The wound was stitched deeply and superficially with catgut, and dressed with iodoform. 1*st Nov.*—Deep stitches removed. Union by first intention. 11*th Nov.*—Patient is now nearly free from pain while sitting. Dismissed to-day.

The above cases are examples of severe distress originating in the coccyx. The first case was exceedingly troublesome, and had resisted all the efforts of the patient's local medical adviser before she was sent to Edinburgh. I accordingly attempted, by cutting the muscular connexions of the bone subcutaneously, to put the sacro-coccygeal joint at rest for some time, in hope that the pain

would disappear. Though there was a suspension of the pain, it recurred with equally as great intensity very shortly after this operation so soon as the muscles again began to act upon the bone. Accordingly, when the patient returned a second time I felt constrained to attempt a more active treatment. With this view I entirely removed the coccyx, clipping through the sacro-coccygeal joint.

The operation is a very easy one, the only difficulty experienced is getting behind the tip of the bone with the knife without injuring the important parts lying in front of it. There is hardly any bleeding. The parts are very vascular, and notwithstanding the fact that they are so near the anus, in both of these cases healing by first intention was easily secured; the second case had become decidedly an inconvenient deformity, as from the way in which the coccyx projected backwards, the patient when she sat was in a condition much the same as that of a person sitting on a thorn. While I had doubts whether or not the first case was warranted, I had none whatever respecting the second case. The immediate relief in both cases was great.

Before presenting the cases to the Society, I wrote the medical attendants of both patients, and am glad to be able to record a successful issue in both cases so far as the operation was concerned. Dr Hardie writes as follows:—"*Forres, 5th March* 1885.—Dear Sir,—Now that nearly three months have passed since J. S. left the Infirmary there can be no doubt she has been much the better of what you did for her. She is free from the old pain in the region of the coccyx, but occasionally has a very sharp shooting pain there, which simply lasts a few moments. Her general health is good; she takes her food well, and is able for a fair amount of exercise every day."

Dr Bentley writes in the following terms:—"*Kirkliston, 4th March* 1885.—Dear Dr Macdonald,—I must say that the partial removal of her coccyx gave Mrs T. great relief from the pains she suffered in her back, but I do not think it relieved her fits."

As I merely performed the operation in Mrs T.'s case to relieve her from the pain she experienced in sitting, and not with any expectation that it would materially affect her hystero-epilepsy, which Dr Bentley in the same letter informs me had lasted for ten years, I considered that the beneficial results in both cases fully warranted the operations.

Hæmatocele.

Case I.—Mrs M., aged 29, admitted 31st August 1884, complained of pain in the abdomen, especially in the right iliac fossa, pain on passing water and after taking opening medicines. The patient had one child four years before admission, and a miscarriage eighteen months ago. Her present illness began seven

weeks before admission. Whilst menstruating at that time she was engaged in washing, when she says she caught cold, and the menstruation ceased.

Physical Examination.—Vagina very much shortened from above downwards; vaginal portion of cervix felt immediately behind symphysis; body of uterus pressed firmly against posterior aspect of symphysis by a large tumour, which fills the entire inlet of the pelvis, and extends markedly above the brim, more especially on the left side. It can be distinctly felt as high as the level of a transverse line passing through the umbilicus. The temperature is normal.

Treatment.—Rest in bed and ice-bags over the abdomen. 18*th Oct.*—During the last month the patient has been kept in bed, her condition has gradually improved, and she has gained flesh. Since admission there has never been any rise of temperature. Examined to-day, when it was found that the uterus was still pressed against the symphysis; the tumour, about the size of a child's head, occupies the posterior part of the pelvis, and projects above inlet; the uterus is attached to its anterior aspect, and the whole mass has considerable mobility; vaginal aspect slightly tender. Dismissed, but ordered to be guarded in her movements. 8*th Nov.*—Patient returned. In the fold of Douglas there is a tolerably firm, elastic, rounded mass, which extends on left side slightly above the brim, on right side is within the brim and less developed. This mass is movable to a certain extent, and has the uterus attached to its anterior part. It does not extend to the side of the pelvis, either on right or left, and is about the size of an orange, flattened from before backwards. It has no tenderness. There is now a wide gap between the uterus and the posterior aspect of the pubes. 20*th Dec.* 1884.—Patient returned to-day to report herself. There is still a considerable elastic, flattish mass behind the uterus, extending slightly both towards the left and right. The uterus lies upon its anterior surface, and is fixed firmly to it. The feeling of the mass is elastic and almost cystic, like a small orange, flattened from above downwards. The conjoint mass is movable.

Case II.—Mrs L., aged 24, admitted 18th Sept. 1884, complaining of incontinence of urine and a severe pain across the bowels. The patient has had two children, last fourteen months before admission. Her first labour was difficult and instrumental. It was followed by an attack of inflammation of the womb and slow recovery. Her present illness began suddenly three weeks ago. She was first seized, whilst scrubbing the floor, with great pain in the pelvis; she felt faint at the time, and became blind, and, on coming out of the attack, she vomited. She continued to have pain for some days, and became rapidly pale, and continues so. The present menstrual period, which has just passed away, is the first which has appeared since her baby was born.

Physical Examination. — 23*rd Sept.* — Posterior aspect of the pelvis is occupied by an elastic, excessively tender mass, in front of which lies the uterus, which is displaced upwards and forwards on the posterior aspect of the symphysis pubis. The upper edge of this mass projects into the abdomen about two and a half inches above the symphysis on the left. It is possessed of some mobility, and is excessively tender. The temperature was normal.

Treatment.—Complete rest in bed and ice-bag over the abdomen. From date of examination until 12th Oct. patient suffered from peritonitic symptoms. She complained of great pain and of troublesome vomiting, and had high temperatures. It was impossible, on account of the tenderness, to define with accuracy the exact amount of increase in the abdominal mass; but it could be made out that it enlarged very markedly in size, and extended quite as high as the umbilicus. The temperature ranged from 101° or 102° in the morning to 103°·5 or 104° at night. At this date a copious hæmorrhagic discharge came from the rectum, along with diarrhœa. This was accompanied by distinct remission of the symptoms, as the pain became less, and the temperature gradually fell to nearly the normal. 13*th Nov.*—During the last three weeks the patient has improved greatly. The discharge from the rectum has ceased. Her temperature is normal in the mornings, and ranges from 99°–101° F. in the evenings. 21*st Nov.* —The patient feels now much improved. The temperature, both night and morning, is normal, and the appetite is fairly good. The posterior part of the inlet into the pelvis is occupied by an irregularly nodulated, somewhat hard mass, on the anterior part of which the uterus is placed. The uterine body can be felt behind the symphysis, the fundus extending about 1½ inch above its upper side. On both sides the mass extends above the brim of the pelvis, although not so high on the left as a line joining the anterior superior iliac spines. The sound enters without pain, upwards and forwards 2½ inches.

Per Rectum.—A nodular, somewhat hard material forms a cast of Douglas's pouch, which, however, it does not distend at all tensely. Dismissed to-day at her own request.

Case II.—Mrs F., aged 36, admitted on 30th Sept. 1884, complaining of pain in the left side, difficulty of and pain on passing water, and on moving the bowels. The patient had five pregnancies at term and no miscarriages. The last pregnancy was five years ago. Up to the occurrence of the present illness she had been menstruating regularly. Three weeks ago, during a menstrual period, whilst sitting at her work of book-folding, she experienced a sudden feeling as of rushing of wind from the region of the stomach down to the bowel, accompanied by a great down-bearing pain. Her face became suddenly pale,

and has continued so since. This attack passed off, and the patient continued her work, but it returned three or four days later. Two days later a gnawing pain came on, and she was seized with retention of urine. She called in a doctor, who drew off her water, and said that her inside was displaced.

Condition on Admission.—Patient is pale and distressed looking; temperature normal.

Physical Examination.—30*th Sept.*—The uterus is displaced behind the symphysis. The hollow of the sacrum is occupied by a soft, elastic, and not specially painful tumour, which is developed more towards the left than to the right.

Treatment.—Rest in bed, and ice-bags over the abdomen. 2*nd Oct.*—Abdomen is somewhat distended and resonant, except at the lower part, where there is a slight amount of tenderness. *P. V.*—The lower pole of the cervix is felt with difficulty high up behind the symphysis, and near the level of its upper edge. The back of the pelvis is occupied by a slightly tender, elastic, and tense mass, which is distinctly firmer than on last examination. The sound enters upwards and forwards 3½ inches. The tumour is felt to project above the brim and somewhat to the left. *Per Rectum.*—A mass is found distending Douglas's pouch, and having the same feeling as per vaginam. 4*th Oct.*—Menstruation began to-day. 10*th Oct.*—Menstruation ceased. She complains of a yellow discharge from the rectum. 13*th Oct.*—Unable to pass water; urine drawn off, affording great relief; discharge from rectum continues. 17*th Oct.*—Bowels loose; some bloody discharge from rectum. 18*th Oct.*—Bowels moved four times; passed some blood by the rectum. 25*th Oct.*—Discharge of blood ceased; bowels still loose. *P. V.*—The pelvic abdominal tumour has shrunk in all its dimensions, and has become firmer; otherwise the relation of parts and position of tumour are the same as on last examination. 8*th Nov.*—Cervix uteri still reached with difficulty, pressed close behind symphysis. The whole of inlet and posterior aspect of pelvis occupied by an elastic, resistant, painless mass, found to extend in abdomen as high as a finger's breadth above the line joining the anterior superior iliac spines. Tumour has some mobility; uterus can be felt on its anterior aspect inside the abdomen. 26*th Nov.*—Patient dismissed nearly well.

12*th March* 1885.—Patient returned to report herself. She feels well, only that she has a dull pain in her back. There is still a considerable amount of elastic swelling in the back part of the pelvis. The uterus is fixed on the front of this mass. The mass is little if at all tender The patient has been able to attend to her household duties ever since she left the Infirmary, and she looks strong and healthy.

The mere fact that in a clinique numbering at most not more than 13 or 14 beds there should have been at one time three undoubted cases of retro-uterine hæmatocele is a very peculiar circum-

stance. According to Schrœder, Hart, and Barbour, etc., the frequency of this accident in relation to all other female affections is set down at ·7 per cent.

My opinion, from increasing experience, leans rather to the conclusion that this estimate is too low. Of course, much depends on the view taken of the leading symptoms, whether one regards a case of hæmatocele as such, or as an example of intrapelvic inflammation.

But considering the evidence given in the above records, it seems to me impossible to doubt the correctness of our diagnosis in any of them. As the second and third burst into the bowel, giving rise to discharge of blood per anum, accompanied with consecutive diminution in bulk of the tumour, the most sceptical observer must agree that these were cases of hæmatocele. But the evidence in all of the three cases was, to my mind, insuperable, else I would not have come to the diagnosis arrived at. It was on the face of probabilities so very unlikely.

Yet when we have a rapidly forming elastic tumour in the back part of the pelvis displacing the uterus forwards, at first unaccompanied with increase of temperature, but associated with symptoms of acute anæmia, it is impossible to arrive at any other conclusion regarding it. In all these cases the symptoms were very well marked, as can be proved on reference to the record.

As to the causation nothing definite can be deduced from the history of our cases. Possibly in Case III. the cause of the hæmorrhage was due to the bursting of an early extrauterine fœtation. This view is further supported by the great persistency of the retro-uterine lump.

It is worthy of notice that retention of urine is a leading feature in the third case, although many authorities say this accident does not frequently occur in connexion with retro-uterine hæmatocele. I am inclined to doubt the correctness of this assertion, as I have hitherto found it a frequent symptom in the cases that have come under my own observation.

The second case presented ultimately the most grave symptoms, and I at one time thought of opening the abdomen and emptying the sac, as Mr Lawson Tait recommends. But it spontaneously emptied itself into the bowel, after which the case progressed favourably.

The treatment of these cases, if we do not open and empty the sac—and that appears to me warrantable only in case the mass suppurates and threatens the patient with death through infection—is to let well alone. They should, if possible, never be aspirated, as that may lead to fresh flow of blood. Still less ought they to be incised freely, as thereby sepsis may be added to other risks.

Relief from pain, if not also partial arrest of bleeding, is affected by the use of the ice-bag. Rest, quiet, and time, with attention to keeping the bowels from being overloaded, will do the rest.

That the most serious cases may get well is evidenced by the case of Mrs L.

Recent experience, especially that of Mr Lawson Tait and Dr Imlach, tend to show that this accident is more frequently associated with hæmato-salpinx, or other disease of the uterine appendages, and, therefore, the legitimate object of operation, than we have hitherto supposed. I have been strongly impressed with this idea since I saw the preparation of the case of hæmato-salpinx exhibited before the Society at last meeting by Dr Skene Keith. The third of the above cases has been again in the Infirmary for the last ten weeks, suffering from a relapse in the hæmatocele, which coincided with the onset of a menstrual flow. This patient, notwithstanding the size and persistency of the hæmatocele, is wonderfully well; and until I saw Dr Keith's specimen and read Dr Imlach's cases I was loath to propose operation. But if there be a renewal of the bleeding at next menstrual period, I have resolved and have obtained permission to open the abdomen and endeavour to find its source and arrest it. As there does not appear any grounds to conclude that the case originated as an extrauterine pregnancy, we are almost inevitably driven to the conclusion that in her case there must exist some tubal disease leading to maintenance of the tumour by additional bleeding at each period.

Gonorrhœal Ovaritis.

G. C., æt. 26, residing at Dysart, recommended by Dr Porteous, was admitted 8th April 1884, complaining of a white discharge, frequent and painful micturition, and dysmenorrhœa. Patient's illness began two years ago, when she had an acute attack of gonorrhœa, with swelling of the external parts, pain on making water. At that time a tumour formed in right groin, and burst. Her illness has continued ever since, and now she sometimes micturates every five minutes. Urine contains blood, and pus, and urates, also a trace of albumen.

Physical Examination.—*9th April.*—A white scar is present in right groin. Labia minora are prominent and elongated, slightly granular to the feel. The extremity of urethra, and, indeed, the entire tube is hypertrophied; walls of urethra thickened, and round about the external orifice it feels almost cartilaginous. *P. V.*—No trace of hymen; vaginal portion of cervix is tolerably normal and virginal. The uterus is small, normal in position, and perfectly movable. Neither ovary can be felt at present. The uterus is barely 2¼ inches long. Sound passes without pain. There is very little pain on pressure of the anterior bladder wall against posterior.

Treatment.—Iodoform bougies ordered. *19th April.*—Temperature ranges from 100° to 102°; complains of great pain in abdomen.

26*th April*.—*P. V.*—A mass felt in left lateral fornix high up; uterus pushed somewhat to right side. Great tenderness on examination. 3*rd May*.—*P. V.*—The mass is sharply defined in left lateral fornix, and feels like an ovary. 16*th May*.—*P. V.*—The uterus is still movable and in normal position. A distinctly rounded tumour is felt behind the right broad ligament, not so well defined as that in left. Fold of Douglas quite clear. Patient was kept in bed, poulticed, had morphia suppositories when pain was severe, and quinine when temperature was high. 22*nd June*. —During the last month patient has suffered from severe attacks of pain in the lower part of the abdomen; one day she may be free from pain, the next she may be the subject of agonizing paroxysms. On examination, the ovaries are easily felt, enlarged, but not tender. Dismissed to-day at her own request.

The case under consideration presents an example, only too common, of the evil effects of gonorrhœa upon the female genital organs. Having convinced myself by a careful scrutiny of undoubted cases of gonorrhœa in the female, observed by myself shortly after the publication of Nöggerath's first paper on "Latent Gonorrhœa in the Female Sex," that the views of the New York physician were essentially correct, I have continued ever since carefully watching cases that came under my observation, in addition to those already read to the Society.

I believe my students have had the importance of the subject dinned into their ears in season and out of season. I know I have been laughed at, if not occasionally sneered at, by my fellow-practitioners as having something of a bee in my bonnet in connexion with this matter. But the more I see of gynæcological practice the more I feel convinced of the enormous evils which the introduction of the gonorrhœal poison into the genital tract of the woman entails, and the more necessary I feel it to be for us to attend with extreme care to every case of gonorrhœa that we meet with. It is especially incumbent on those who have to deal with young men about to marry, who have ever contracted gonorrhœa, to make sure that they are absolutely and completely free of every trace of the disease, however latent, before they permit them to get married. If they do not it is nearly certain that the innocent wives will become the victims of a nearly incurable specific catarrh of the genital passage a very short time after marriage. If this be true in such circumstances, it is doubly true when one has got to deal with unfaithful husbands who contract this disease. I am glad to observe that in Germany the profession is waking up to the importance of this question, as is testified by the contributions on the subject made by Sänger and others at the Medical Congress at Copenhagen last year. On mentioning my views on this matter lately to a surgical friend who has had large experience in the Lock Hospital, I was met with the objection that he had not seen very specially severe

results follow gonorrhœa in the female cases treated there. But to this I urged, and would now urge, that such observation is no adequate test of the serious results which I believe follow from this disease in woman. The most undoubted observers combine in testifying that the early effects in woman are not so serious as in men. The ardor urinæ, swelling of the vulva, the vaginitis, etc., are not nearly so severe as the corresponding conditions in men. But that is only the beginning of the ailment. The results make themselves manifest long after the patient has left the Lock Hospital.

In the present case the primary disease was contracted two years before the patient entered the hospital. In her case there was established a chronic urethritis with pain on making water, and also some uterine catarrh and dysmenorrhœa. The uterine catarrh and the dysmenorrhœa are a prolongation in time of the gonorrhœa which Dr Nöggerath would then call latent.

Such a condition may result, as in this case, from an acute attack, or may be the result of prolonged connexion with a husband affected with the latent disease. However induced, a patient with such a specific catarrh carries within her the elements of a possible inflammatory explosion. Whether such a catarrh may be capable of being diagnosed by finding a special gonococcus or not as described by Neisser,[1] and supported by Herschberg and Krause,[2] by Oppenheimer,[3] etc., I do not stay here to inquire. I form my opinion on clinical facts, which are satisfactory to my mind on the subject. These clinical observations show us in the present case that the catarrh extends higher and higher up the genital tract until uterus, tubes, and ovaries are involved in a common destruction.

It will be observed in the present case that we saw under our eyes the formation of, first, an inflammation of the right, and subsequently of the left ovary under irritation of an extension of the catarrh from the uterus. Such cases are apt to produce first adhesive inflammation between the ovaries and the trumpet shaped extremities of the Fallopian tubes. The tube next becomes obliterated towards its uterine extremity. The secretion of the tube is now poured into a cavity whose walls are composed of the Fallopian tube and a more or less extensive portion of the ovary. This leads to dilatation of the tube, and ultimately to disfigurement of the ovary, the complex sac formed containing clear fluid, more or less deeply coloured fluid, or pus, according to circumstances. The ovaries are found sometimes cystic, sometimes the seat of atrophy. Ovarian pain and distress, sterility, recurrent attacks of pelvic inflammation, and broken down health result, the only cure frequently being removal of the uterine appendages.

[1] *Centralblatt für die Medicinische Wissenschaften*, 1879.
[2] *Centralblatt für Practische Augenheilkunde*, 1881.
[3] *Archiv für Gynäkologie*, Bd. xxv. s. 51.

It is, however, certain that in a large number of women subjected to the action of gonorrhœa such serious results do not arise. I have known women with well-marked acute gonorrhœa pass through the puerperal state even without a single bad symptom. I have known others have a serious swim for life in that condition, and I have found death result from it directly. What is the reason why at times the disease is so much more virulent than at others? I confess I cannot say, except it be, as Nöggerath would have it, due to some special susceptibility of the patient. But while allowing for a considerable number of patients getting well of the disease, such a large proportion are victimised as to warrant us in regarding gonorrhœa, however acquired, as a most serious disease for a woman, and one to be intelligently and faithfully dealt with whenever it is seen.

Before leaving this subject I would draw the attention of the Fellows to the most interesting paper by Oppenheimer already referred to. In that paper the author, after instituting a series of experiments, taking the presence or absence of Neisser's diplococcus as his test, comes to the astounding conclusion that 27 per cent. of all the puerperal patients applying for aid at the Heidelberg Maternity between January and September 1883 suffered from gonorrhœa. He then follows up with a series of elaborate experiments upon the effects of the substances ordinarily reputed as curative of gonorrhœa, upon the life of the gonococci, arranging them under the heads of—(1.) Heavy metals; (2.) Alkalies; (3.) Organic substances. After subjecting the results obtained to an exhaustive criticism, he formulates his final results in the following terms:—

"The results of my observations may be briefly synopsized to the effect that the gonococci possess a very great power of resistance to chemical reagents, or, in other words, that the substance tested did not possess the antimyotic properties ascribed to them in reference to the gonococci. Only the sublimate and creasote have proved themselves to be decided poisons as truly substances practically valuable. There is further success to be expected in the therapeutic application, both of copaiba balsam and of cubebs, but not in their local administration. These substances must be given internally, in order that the substances poisonous to the gonococci may arise in the organism, and may act upon them during their excretion in the urine. For prophylaxis the nitrate of silver recommended by Credé in 2 per cent. solution is doubtless the most effective. Although the other substances, especially the metallic preparations, have proved unsuitable to destroy the cocci, I should not wish to go so far as to deny to them any value in the treatment of gonorrhœa. It is certainly possible that these substances, in consequence of their astringent peculiarities, the nature of which has not hitherto been satisfactorily explained, may, without directly injuring the cocci, change the mucous membrane,

serving as a basis of support to them, in such a way that there arise unfavourable conditions for the further development of the spores, and may thereby indirectly arrest the increase of the disease producing agent, and through that may stop the disease itself. Dr Oppenheimer's results regarding the effects of copaiba and cubebs were obtained by treating the diplococci with the urine of persons who had taken these drugs by the mouth.

Professor Simpson had been much interested in hearing the remarks on the various cases described in Dr Macdonald's paper. He was quite at one with him as to the great dangers arising from gonorrhœa in the female. Bumm has pointed out that the great difficulty of attacking the gonococcus in the female by vaginal douches, etc., lay in the fact that the gonococcus nestled not in the squamous vaginal mucous membrane, but in the mucous membrane of the cervix, and other more inaccessible parts of the genital tract.

Dr Peter Young asked how Dr Macdonald felt justified in attributing the attack of ovaritis, from which his patient suffered, to gonorrhœa. It seemed to him that the attack might quite well be explained by the mechanical examination to which the patient was subjected. It was quite well known that the passage of the sound in certain cases was followed by an attack of ovaritis, and he thought such an explanation was quite sufficient in this case, without going the length of attributing it to gonorrhœa.

Dr Macdonald, in reply, said that the reasons which caused him to attribute the ovaritis to gonorrhœa were:—1. That the patient had suffered from the results of the disease in other organs continuously since the first attack two years ago; 2. That only guarded examination of the pelvis was made, the sound having been only once passed; 3. That a patient lying quietly in bed could scarcely be the subject of an attack of simple ovaritis; that, in short, the case could only be explained on such an assumption.

V. A CRITICAL CONSIDERATION OF THE METHODS OF ANATOMICAL RESEARCH, WITH SPECIAL REFERENCE TO THE TOPOGRAPHICAL ANATOMY OF THE FEMALE PELVIS.

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It may seem, on first sight, an unnecessary proceeding to consider critically the various methods of anatomical research. But although the reputation of the human anatomist for accurate and painstaking work, even to the verge of unnecessary detail, stands high in the profession, it is a fact, nevertheless, that the most widely practised method of anatomical research is far from exact, and that the results gained by newer and more careful

investigation have brought out startling errors in many of our text-books. Progress in medical science so much depends on methods of investigation, as is well illustrated by the advance of microscopical science after the use of staining reagents, and of medicine and surgery by the application of the isolation and cultivation of micro-organisms, that it seems to me useful to direct the attention of anatomical teachers and anatomical specialists to the subject indicated in the title of this paper. I feel confident that there is a wide field before anatomists in the subject of the accurate determination of human topographical anatomy, and that the practical branches of the profession will profit by it.

I purpose first taking up the various methods of naked eye anatomical investigation, pointing out their excellences and defects, and, finally, trying to display the topographical relations of the female pelvic floor and pelvic organs, as determined by a trustworthy anatomical method or combination of methods.

The known methods of anatomical research are five in number, as follows:—

(1.) *Ordinary dissectional.*

(2.) *Dissectional or sectional after hardening.*

(3.) *Sectional after freezing.*

(4.) *Sectional after freezing, followed by fixation in plaster and careful dissection.*

(5.) *Microscopic sections of fœtuses.* This gives valuable results, both for naked eye and microscopic purposes, but I defer further consideration of it at present.

(1.) *The Ordinary Dissectional Method* must at present be considered in two aspects,—viz., as a means of teaching the student the ordinary facts of anatomy, and, above all, of cultivating his eye and sense of touch; and as a method for the anatomist of ascertaining the facts of anatomy. Its first use is most valuable, and one that fits the student for the practice of his profession better than any other course of study. It teaches him how to observe and how to regulate his muscular action, and educates his touch sense, all in addition to the anatomical facts he learns or verifies. As a means, however, of ascertaining anatomical relations it is very misleading, owing to the amount of displacement involved in its practice. All anatomists are well aware of this, but its most striking illustrations can be taken from the anatomy of the female pelvis. Thus, in a well-known anatomical text-book (Gray's, seventh edition), deservedly popular among students, there are at least six errors in the drawing of the sagittal section of the female pelvis, and in the drawing of the external genitals, three.[1]

[1] These errors are as follows:—

(*a.*) *Sagittal section of female pelvis*—(1) Dilatation of vagina; (2) position of uterus; (3) position of broad ligament; (4) position of Fallopian tube; (5) position of ovary; (6) inclination of pelvic brim in upright posture; (7) length of vaginal walls.

(*b.*) *Genitals*—(1) Representation of labia minora as mucous membrane;

One other illustration will help to show the defects of this method. The ischio-rectal fossa is defined out in the dissection of perineum. The anatomist, however, is unable to do more than learn that its outer boundary is the obturator internum, and its inner the levator ani. In what proportions these form the boundaries, what forms the floor of the fossa, and where and how its apex lies, his method fails to teach him. Sectional anatomy, however, gives these precisely.

(2.) *Sectional and Dissectional Anatomy after hardening and embedding in Plaster* has been well described by His of Leipzig. Five to ten litres of a half or one per cent. solution of chromic acid are injected under a mercurial pressure of 100 to 120 mm., until the skin and superficial mucous membranes are coloured yellow. The trunk is then embedded in plaster, so much sawn away as is necessary to expose the region wanted, and then careful dissection or manipulation employed. When a region is thus reached, any structure likely to be displaced by manipulation and adjacent structures may be fixed by plaster of Paris. The results thus attained by His are of great value.

I have practised this method in a modified manner by hardening pelves in the ordinary mixture of Muller's fluid and spirit used for microscopical specimens, and found that good sections of the pelvic floor could be thus obtained.

(3.) *Frozen Sectional Anatomy* is now much used in this country as a means of investigation, and is probably one of our most accurate methods. The best sections are those made sagittally, or in the coronal direction, and the only objection that can be urged is that the view of parts afforded, especially in transverse sections, is too limited. This disadvantage, however, is quite overcome by the following modification.

(4.) *Sectional Anatomy after Freezing, followed by Fixation in Plaster, Hardening in Spirit, and careful Removal of Tissues or Structures covering the Parts to be Demonstrated.*—The evident advantages of this are that a slab of any thickness or of any special part can be sawn, accurately fixed in plaster, with one surface free of course, traced, and then, when hardened in spirit and washed, dissected carefully with a minimum of displacement.

The application of this last method to the determination of the topographical anatomy of the female pelvis will now be considered. While much important information as to this has been collected by the clinical work of Schultze, Foster, Van de Warker, Ranney, and others, its accuracy has always seemed to me open to doubt. In the first place, the bimanual method of investigation necessarily displaces the organs before they are fairly grasped and defined by

(2) fourchette placed as anterior boundary of fossa navicularis instead of posterior ; (3) posterior commissure figured as a separate structure instead of being named fourchette

the examining hands. Then the pelvic brim and outlet are difficult to define, and thus errors creep in in the delineation. A more serious objection is, that the anatomy of the pelvic floor cannot be so determined, is usually erroneously figured in pelvic sections clinically determined, and thus gives rise to fresh errors.

The method for the determination of the topography of the female pelvis I recommend is as follows:—The cadaver of a healthy adult woman is taken as a basis for the investigation. The pelvis must be free from cellulitis and peritonitis, and with the bladder and rectum naturally empty.

All these points will be readily granted except the last. It is usual to consider a moderate distension of the bladder and rectum as necessary to render the pelvis normal. Hasse, in his investigation, injected the bladder with water; and His injected the rectum. Now this has always seemed to me wrong. In the first place, it is an artificial disturbance of the body. There is no evidence that artificial distension of the rectum with fluid is the same as its natural distended condition. Then, further, the results obtained on such cadavera cannot be compared with clinical work where the bowel and bladder must be empty for proper investigation. The ridiculous custom of distending the bladder fully before freezing, so as to get a normal (?) condition of parts, need only be mentioned to be condemned.

I was lately fortunate enough to obtain a cadaver fulfilling the conditions already laid down. When frozen, it was first sawn in the middle line. It could then be seen that, while the uterus lay anteverted, it was at the same time lying towards the left side, and was consequently cut a little to the inside of its junction with the broad ligament. A lateral sagittal section was then made, so as to cut the uterus mesially. Each slab was fixed in plaster and then hardened in spirit. When hardened, the small intestines were carefully lifted out of the fornices, and then the ovaries and Fallopian tubes exposed *in situ*.

Fig. A. in the Plate shows a careful drawing made after the slabs had been placed in apposition.

The points to be noted specially are as follows:—

In regard to the *pelvic floor:* the parallelism of the vagina, urethra, and part of the rectum behind the vagina, to the conjugate of the brim, and the shape of the empty bladder, as well as the length and direction of the anus, are well seen.

In regard to the *uterus:* it has to be specially noted that its cavity is not opened into owing to its left-sided deviation. This, however, is normal, as the uterus is seldom mesial.

The uterus lies within the normal range of position, while the Fallopian tube on the left side runs out horizontally, then vertically, when it turns almost at a right angle to touch the ovary. Probably this last arrangement is uncommon, as His

found the ovary lying in a curve or bend of the Fallopian tube usually (*v.* B. in Plate).

In regard to the *ovary:* it lies on this side of the pelvis with its long axis nearly vertical. When the uterus is central, this holds good for both ovaries, but usually the lateral position of the uterus only allows of the ovary of the side towards which the deviation is holding this direction, the other ovary necessarily lying with its long axis oblique.

The Plate gives a view of the pelvic floor and uterus with its annexa more perfect than any I have hitherto seen. On some points, however, it varies from the normal. These are—(1) as to the dip of peritoneum, behind the posterior vaginal wall; (2) the relation of the ampulla of the Fallopian tube to the ovary. Probably the arrangement figured by His, and shown at B., is more normal.

PLATE.—**A.** *Sagittal mesial section of female pelvis: u*, uterus; O, ovary; F, Fallopian tube; *i p*, infundibulo-pelvic ligament; *v u p*, vesico-uterine pouch; B, bladder; *urth*, urethra; V, vagina; P, perineal body; *l mi*, labium minus turned back. **B.** *Uterus and ovaries seen through brim* (His).

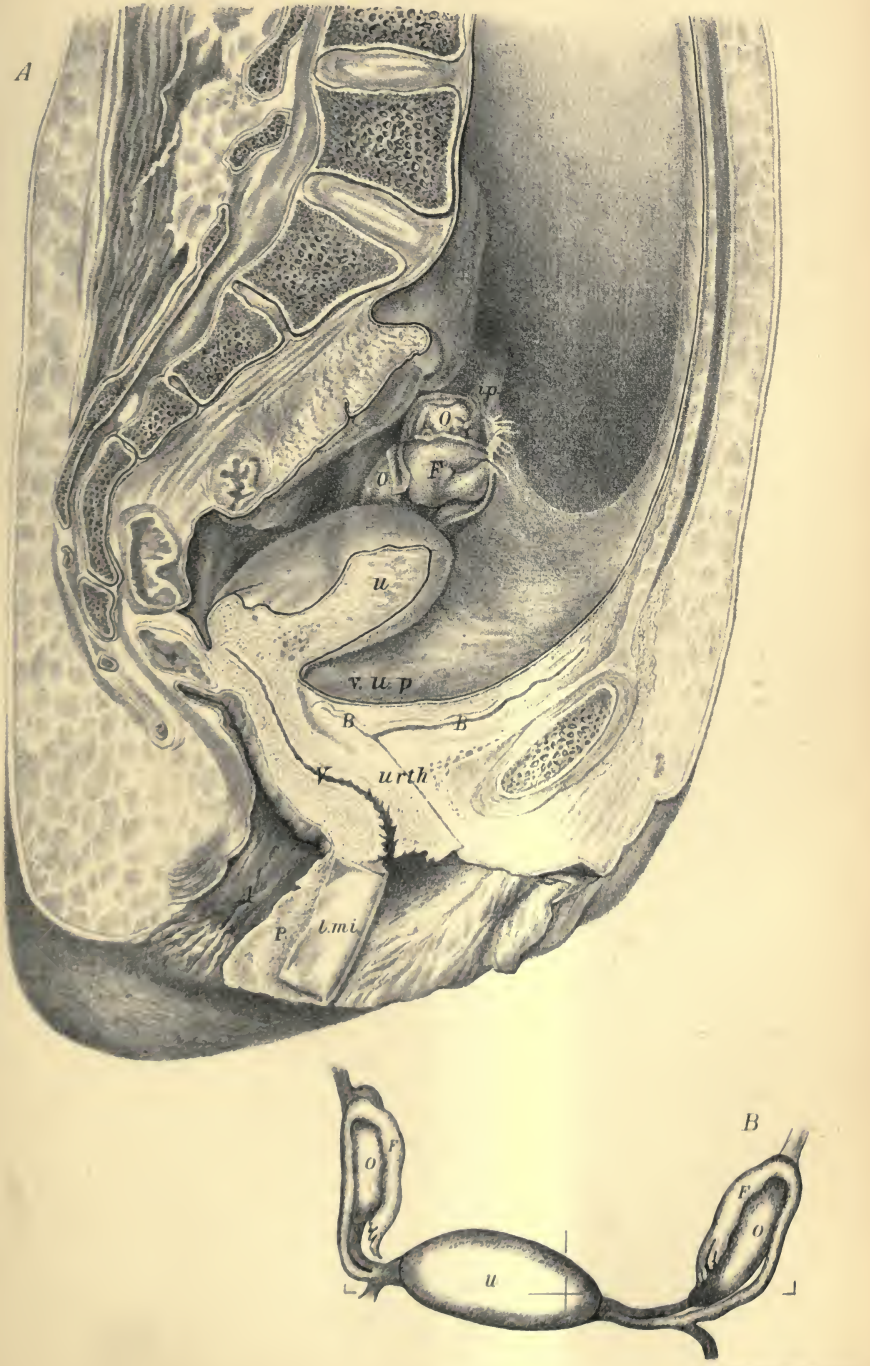
The paper was illustrated by a large number of photographs and microscopic objects, exhibited by means of the lime-light.

Professor Simpson thought that the Society was greatly indebted to Dr Hart for the interesting paper he had read, and the valuable and instructive demonstration he had given. Dr Hart had done good work in this department of study already, and he was sure they wished him all success in getting materials for further observation.

Dr Macdonald had enjoyed the demonstration exceedingly, and was glad to see that Dr Hart's energy in this study was still active. They had become quite accustomed to Dr Hart's good work in such important studies, and he was glad to see that we might still expect further contributions to our knowledge of this subject.

Dr Freeland Barbour thought that special acknowledgment should be made of the value of the lime-light in such demonstrations. He was specially amused at the way in which Dr Hart had carried war into the camp of the older anatomists, not hesitating to attack even the time-honoured Gray. The most original part of the paper was that relating to the ischio-rectal fossa, and the position of the ureters. He thought the point regarding the latter was an exceedingly important one in regard to operation. It would be interesting to know, in addition, how far the ureters retract after the tissues have been divided.

SAGITTAL MESIAL SECTION OF FEMALE PELVIS.



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Meeting XI.—July 8, 1885.

Dr Foulis, afterwards Dr Underhill, *in the Chair.*

I. *Dr Barbour* showed—(1.) section of uterus and placenta removed by Porro's operation; (2.) microscopic sections showing the changes following separation of the placenta, and directed special attention to the changes in the vessels; (3.) a form for recording gynæcological cases.

II. *Dr Angus Macdonald* showed an ovarian tumour presenting some peculiarities. The tumour was removed three weeks ago, and presented peculiar relationships. It had been diagnosed by the medical man in attendance as a hard tumour on the right groin, with a fulness in the abdomen. The lady had been seen once by Dr Macdonald before this and sent back. There was a history of perimetritis three months previously to that visit. The diagnosis was easy—an ovarian tumour with fluctuations, etc. The most remarkable feature in the case was the position of the uterus, which was displaced much as we find it in retro-uterine hæmatocele; *i.e.*, the tumour being deep in the pelvis, the uterus could only be felt and nothing more, being displaced upwards in front of the tumour. The operation was arranged for at the time mentioned. Dr Foulis gave chloroform. Dr Macdonald was prepared to find the uterus high, but, as a matter of fact, found it right in front of the tumour. The tumour was fixed to the fundus by firm adhesions. After fixing the uterus firmly, the tumour was punctured, and a quantity of fluid escaped. Beyond these binding the tumour to the uterus no other adhesions existed; and these being broken down, the tumour was readily removed. A body was found attached to the side of the tumour, which he supposed to be the ovary. The points to be noted in this case are:—1. The way in which the tumour had attached itself to the uterus, and which explained the way in which the uterus was drawn up. 2. A practical part of importance is the danger of mistaking the flat uterus for part of the tumour, and of passing the trocar through it.

Dr Foulis said that a point of interest was to decide which of the two masses was the ovary, the large or smaller. It seemed to him at first that the smaller was the ovary; but more careful examination convinced him that this was not the case, and that no ovarian characters were to be found in the smaller mass, which consisted chiefly of areolar tissue; and he was consequently inclined to regard this as one of those masses of fœtal tissue which we sometimes meet with in this position, but which have no true connexion with the ovary proper. He had often seen them in examining the ovaries of very young children. They seem to be

originally masses of ovarian tissue, from which all true ovarian elements eventually disappear completely.

III. *Dr Macdonald* also showed an OVARY removed from a patient who had been bed-rid for three or four years. She had a small parovarian cyst between the fimbriated end of the Fallopian tube and the ovary, pressing on the latter in such a way as to cause great pain. The ovary was somewhat degenerated and cirrhotic.

IV. *Dr Peter Young* read a

CASE OF INVERSION OF THE UTERUS AFTER LABOUR.

By GUSTAVE MICHAEL, M.B., C.M., Craiglockhart Poorhouse.

OWING to the rarity of cases of inversion of the uterus, the following notes of a case which occurred in my practice may be of interest to the profession. On Saturday, the 14th March, about 10.30 A.M., I was asked to go and see a patient who, the messenger said, had had a child some time before, and was supposed to be "going out of her mind." On my arriving there—the distance was not more than 100 yards—it was at once evident that the woman was suffering from loss of blood. She was throwing her arms about, and sighing deeply. Her face was deadly pale, and her skin was covered with a cold, clammy perspiration. The pulse at the wrist was scarcely perceptible, and she was almost unconscious. On inquiry I was told that the child was born at a quarter to nine, and that the placenta had come away half an hour afterwards all right. The labour was not tedious, and the woman was delivered in bed. On placing my hand over the abdomen I could not feel the uterus. On proceeding to make a vaginal examination the bed was found soaking in blood, and covered with a large quantity of clots. On introducing the hand into the vagina I found a large globular mass lying just within, and bleeding profusely. I at once introduced the whole hand and traced its connexion, and found it was the inverted uterus. On making a bimanual examination the cup-shaped depression in the uterus could be felt by pressing deeply with the abdominal hand. I immediately sent for Dr Hope, and in the meanwhile gave ergot and stimulants, and attempted replacement, but was unable to succeed. Dr Hope, on his arrival shortly afterwards, also failed to replace the mass. We therefore procured some pernitrate of iron, and swabbed the uterus with it, and so partially checked the bleeding. Dr Smith, who had also been sent for, came in some time after, but also failed to reduce the inversion.

The woman died shortly afterwards with all the signs of death from hæmorrhage. On after inquiry I ascertained that it was her

second labour, and that in the first case the forceps were used. She had never been very strong.

The woman who was with her on the present occasion, and who, I may state, was no midwife, stated most emphatically that there was no excessive traction on the cord while removing the placenta, and that it came away quite easily. The symptoms came on gradually, and there was no violent effort of any kind on the part of the patient to have caused the accident. A post-mortem was obtained next day, and completely confirmed the diagnosis. There was a large cup-shaped depression over the position of the fundus, in depth, on rough estimation, about 5 inches.

Dr Young remarked that the case was recorded briefly, but he thought that Dr Michael did well in bringing it before the Society. This was an undoubted case of spontaneous inversion. The woman who attended was not a professional midwife, and was thus not likely to drag on the cord. The production of the condition required—1, a large size of the uterine cavity; and, 2, a relaxed state of the wall; and both were apparently present here. As to the diagnosis, he considered that Dr Michael deserved credit for the quick way in which he made the diagnosis. So far as he could form an opinion of the case, he believed that the patient had died of shock.

Dr Angus Macdonald would have liked to have had more definite information as to the history of the placenta. He thought they were indebted to Dr Young for bringing the case before them. He had seen three cases, one in Dr Matthews Duncan's practice, and two in his own. The diagnosis is not difficult immediately post-partum, but later on the difficulty becomes very considerable.

Dr Gordon asked whether chloroform had been given during the attempts at reduction.

Dr Foulis felt doubtful as to the mechanism being explained by a supposed expansion of the uterus. He did not think that the organ could yield so as to form a true space, which seemed to be assumed.

Mr Skene Keith would like to know the opinion of the Fellows as to the advisability of giving ergot when the uterus was inverted. He thought this was open to criticism.

Dr Underhill said that seeing the case was so imperfectly reported, it was impossible to come to any definite conclusion as to the condition. He had some doubts in his own mind as to how far they would be justified in excluding traction on the cord as an element in the causation. The action of the attendant at the time of delivery of the placenta did not seem very clearly ascertained, and it seemed to him quite possible that there might have been some improper interference then.

V. RARE CASES OF MALIGNANT DISEASE OF THE FEMALE SEXUAL ORGANS.

Observed in the Buchanan Ward, under Professor Simpson,
by FOURNESS SIMMONS, M.B., Buchanan Scholar.

DURING the past year several rare and interesting examples of malignant disease of the female genitals have been treated in the Buchanan Ward of the Royal Infirmary, under the care of Professor Simpson, and by his kind permission I now bring them before the Society.

CASE I.—*Primary Epithelioma of the Clitoris; Removal; Relief of Symptoms; Subsequent Recurrence.*

C. L., æt. 69, married, was admitted into the Buchanan Ward on 31st October 1883, on the recommendation of Dr Hunter of Queensferry, complaining of a pain in the private parts aggravated by micturition. Seven weeks previously, patient experienced a constant feeling of itchiness in the external genitals, which led to scratching of the parts and aggravation of the symptoms. A fortnight subsequently suffered acute pain during urination. There is no history of syphilis or hereditary tendency to carcinoma.

The physical examination showed, on separating the labia in the position of the clitoris, an irregular, nodular mass, its margins being prominent and uneven, the centre presenting a reddened, worm-eaten appearance. The margins were distinctly indurated, the central portion being softer, more friable, and bleeding readily. The whole tumour, which was circumferentially barely the size of a shilling, appears to be sharply defined from the surrounding tissues. The inguinal glands were slightly enlarged and indurated on both sides. The vagina, cervix, and uterus were healthy.

The diagnosis of epithelioma clitoridis was accordingly made, and it was determined to remove it without delay. On 6th November, the patient having been anæsthetized, Professor Simpson passed a series of silver-wire sutures underneath the tumour (care being taken not to include the urethra by the previous passage of a catheter), clipped it away with scissors, ligatured the numerous bleeding points with catgut, and brought the edges of the wound thus made into accurate apposition by the wire sutures. After dusting the surface with a powder composed of equal parts of iodoform and bismuth, a pad of salicylic silk was fixed over the pudenda by a T bandage (to prevent hæmorrhage), which was removed the same night, and the urine drawn off.

On 12th November four of the stitches were removed, and on the 14th the remaining two sutures were also taken out. On 18th

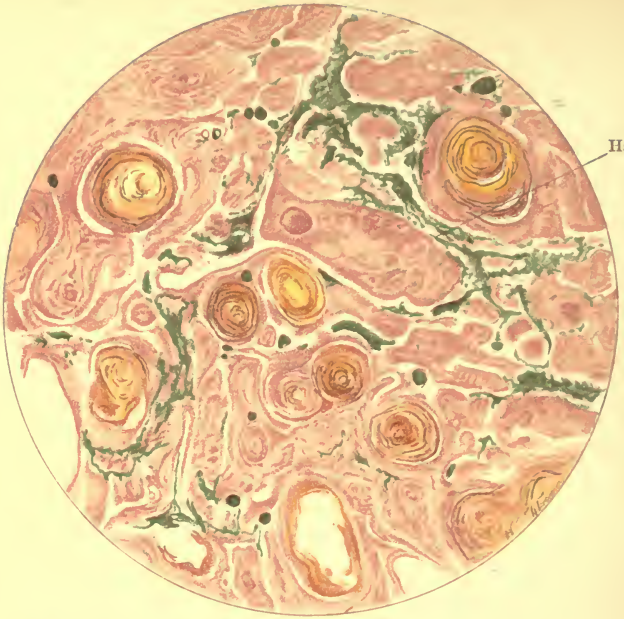

Fig. 2. Section of Epithelioma of Labia—stained picrocarmine (× 50)

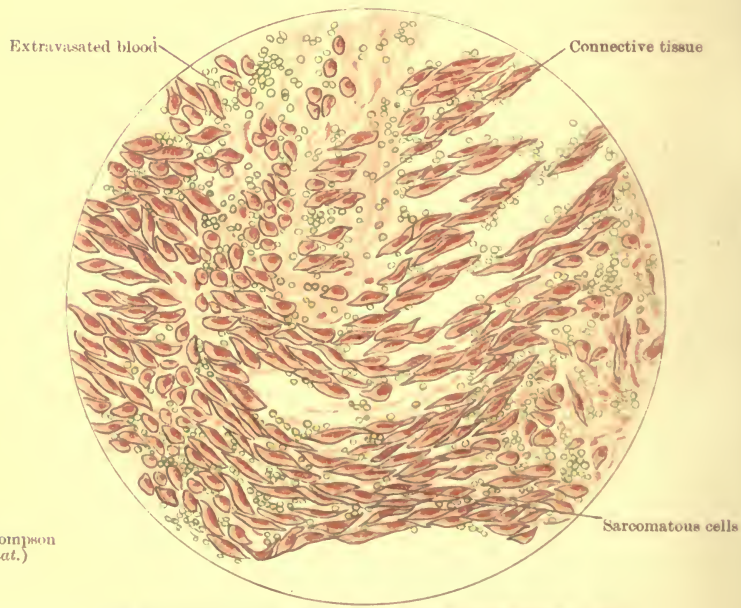

Fig. 3. Section of Sarcoma of Vagina : stained picrocarmine (× 300)

Fig. 1. Section of Epithelioma of Clitoris—stained picrocarmine (× 40)

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November, the wound having healed perfectly, she was dismissed, and, on reporting herself a month later, she had had no pain nor dysuria since the operation, and there was no evidence of return of the disease in the cicatrix or elsewhere.

Her doctor kindly wrote to me on 10th March 1885, saying, "There is still some hardness over the area where the disease was removed, and the right inguinal glands are very much enlarged, and so hard as to suggest the possibility of their also being invaded by the cancer. Towards the perineal end of the right labium and in the posterior fornix there are undoubted evidences of its extension."

On microscopic examination the tumour presented the usual appearances of an epithelioma, but manifests the following points of interest. In one part the growth inwards of the deeper layers of the epithelium is well marked, which does not seem to produce any irritative changes in the connective tissue immediately beneath them (see Fig. 1). Elsewhere the growth and formation of cell-nests has taken place so rapidly that there is very little or no newly formed connective tissue stroma separating them, and the cell-nests also show two or more horny centres. With the high power (300 diameters) the epithelial cells show very interesting degenerative changes; the protoplasm increasing in amount becomes less granular, but more opaque in some of the cells, whilst in others the protoplasm becomes clear, well defined, and more or less globular, the nucleus having disappeared. Some cells show the striæ continuous with the prickles running from the periphery to the nucleus, while in many of the cells there are two or more nuclei, each containing one or two well-marked nucleoli. The division of the nucleus into two is often very distinctly seen, whilst frequently a clear space is formed around the nucleus, and some nuclei are completely transformed into clear vesicles, even where the cells are well marked.

Case II.—*Epithelioma of Labia Majora; Removal.*

M. C., æt. 51, a married woman, was admitted into the Buchanan Ward on 6th April 1885, complaining of a "small tumour in the privates." About five months ago the patient felt some uneasiness and slight itchiness in the vulva, and, on passing her hand over the parts, felt a small swelling on the left labium, about the size of a sixpenny piece. There is sometimes slight uneasiness in the swelling after exertion, and at night, but beyond this it has produced no symptoms.

Springing from the posterior extremity of the left labium majus, and also attached to the skin just below this, is seen a somewhat heart-shaped mass about the size of a shilling, which has a uniformly red appearance, being smooth peripherally, while it is uneven and somewhat excavated towards the centre. It is of moderately hard

consistence, does not seem sharply defined from the surrounding tissues, non-sensitive to touch, and does not bleed on manipulation. Anterior to this, but separated from it by a groove, is a small, slightly elevated patch, about the size of a split pea, which is of the same appearance and consistence as the last, which is again separated by a reddish, ulcerating looking groove from a third narrow patch, about an inch long, at the posterior end of the right labium majus, which had the same characters as the foregoing. The inguinal glands are unenlarged. The vagina and cervix are healthy.

On 7th April, chloroform having been administered, Dr Halliday Croom, during Professor Simpson's absence, removed the diseased tissues as far as possible by Paquelin's cautery. Subsequently the parts were swabbed with a saturated solution of zinc chloride. Since her dismissal on 16th April, I have not heard from the patient, though she promised to let me know if there were any signs of its recurrence.

In this specimen, which is very similar to the last, the connective tissue between the epithelial cells is very vascular (see Fig. 2), and at the free margin there are a few much enlarged sebaceous follicles, showing their characteristic epithelium in a state of proliferation.

Cases of vulvar epithelioma cannot be considered as commonly met with in practice. Authors by no means agree as to the most frequent primary seat of the disease in the external generative organs. According to West and Duncan,[1] De Sinéty,[2] Hart and Barbour,[3] the labia majora are most commonly first affected; whilst Barnes,[4] Thorburn,[5] and Klob,[6] maintain that the clitoris is especially prone to be the first seat of the lesion; Edis[7] and Graily Hewitt,[8] stating more broadly that any part of the external genitals may be the starting point of the disease. Be this as it may, cases where the disease is localized to the clitoris (as occurred in Case I.) have received such scanty attention, so far as I can ascertain, that I can only find reference to five such cases—the first recorded by Hutchinson[9] (doubtfully malignant), the second by Valeriani,[10] and the remaining three quoted by Hildebrandt,[11] one of which occurred in his own practice, and the other two in that of Mayer (one of them being figured). This is all the more to be wondered at, because cases so localized would be the most amenable to treatment, being the most hopeful for total eradication, and therefore the more likely to be recorded.

[1] *Diseases of Women*, p. 662.
[2] *Traité de Gynécologie*, p. 123.
[3] *Manual of Gynecology*, p. 515.
[4] *Diseases of Women*, p. 884.
[5] *Diseases of Women*, p. 45.
[6] *Pathologische Anatomie der Wieblichen Sexualorgane*, p. 466.
[7] *Diseases of Women*, p. 365.
[8] *Diseases of Women*, p. 771.
[9] *Med. Times and Gazette*, Oct. 1860.
[10] *Ann. univ. di. med. e. chir.* Milano. Vol. 269, p. 432.
[11] *Die Krankheiten der Aüsseren Wieblichen Genitalein*, p. 62.

The difficulties of diagnosis between epithelioma and lupus have been referred to so fully in a most able paper,[1] read by Dr Angus Macdonald before the Society last year, that I have nothing more to say upon this point, except that the second case described was actually mistaken for vulvar lupus, as there was no enlargement of the inguinal glands, and pain was entirely absent, the new growth itself not possessing the usual characteristic hard feeling of a malignant neoplasm, and it was only on microscopic examination —the crucial test in the existence of doubt—that the true nature of the case became evident.

In regard to the treatment of vulvar carcinoma several points of practical importance are brought out in a paper by Küstner on the subject.[2] He maintains that where the inguinal glands lying on the diseased side are in the least larger than the corresponding ones on the healthy side, they should be removed by an extension of the primary incision laterally, which is a still more plausible and more easily carried out procedure if the disease be situated near the clitoris. In the two cases in which Küstner removed the superficial inguinal glands the disease returned, and he therefore advises removal of the deeper glands by opening the fascia lata and laying bare the vessels of the upper leg for some distance. As he wisely adds, this portion of the operation is laborious, and whether successful future observation will show. I am not aware if any one here has given this suggestion of Küstner's a trial, though it seems to me a very plausible one, and I do not see why it should be more difficult to extirpate enlarged inguinal glands than to remove enlarged axillary glands—secondary to scirrhus mamma. If we remove the enlarged glands we give our patients the only chance—perhaps a slender chance at best—of permanent cure; and if we fail we have the consolation of knowing we have kept in mind the old saying, "What is worth doing at all, is worth doing well."

CASE III.—*Sloughing Sarcoma of Posterior Vaginal Wall; Removal; Death a Month subsequently from Recurrent Hæmorrhage.*

A. M., æt. 19, married, was admitted into the Buchanan Ward on 27th November 1884, on the recommendation of Dr Freeland Barbour, complaining of a sanious discharge from the vagina, and pain in the lower part of the abdomen.

Her illness commenced seven weeks previously to admission by what appeared to be an ordinary menstrual flow, but the discharge continuing copiously for a fortnight she grew alarmed, and sent for a medical man, who gave her some medicine which greatly checked it. This continued uninterruptedly until five days before admission, when a sudden gush of blood took place from the vagina, and

[1] *Edin. Obstet. Trans*, vol. ix. p. 56.
[2] *Zeitschrift für Geburtshülfe und Gynäkologie*, vol. vii. 1881.

this recurred the following day whilst straining at stool, when, for the first time, it was noticed to have an offensive odour. A fortnight since patient noticed a small lump in the vagina, which came down during defecation, but never caused any pain. About a month after the onset of the discharge she was troubled with pain in the left iliac region, extending to the small of the back, and down the left leg as far as the knee.

The patient was anæmic to the last degree; expression careworn and anxious. There was a loud *bruit de diable* in the neck, and loud murmurs (probably organic) in the mitral and auricular areas. On everting the posterior vaginal wall with the finger in the rectum, a circumscribed swelling about the size of a walnut is brought into view, covered with vaginal mucous membrane, except on the lower and left side, where there is an irregular patch about the size of a sixpenny piece, which presents a blackened, sloughy appearance, and has an irregular surface. The margins of this patch are irregular, somewhat sharply defined, especially on the right side, but neither thickened nor hard. To the left of the posterior raphe of the vagina the mucous membrane has a bluish, patchy appearance, alternating with its hyperæmic condition around. This tumour had a solid consistence, not nodular; surface smooth, except over the sloughing patch alluded to, and was readily pushed outwards from the vagina by coughing or forced expiration. The vagina elsewhere, cervix, and uterus are healthy.

On admission (27th Nov.) she was ordered a hypodermic injection of ergotin (3 grs.) each night, and the following mixture internally:—

℞ Tinct. ferri. perchlor., . . ℥iij.
Tinct. digitalis,
Acid. phosphoric. dil., . . āā ℥j.
Aquam ad., ... ℥vj.

Sig. ℥ss. ter in die post cibum.

30*th November.*—Copious viscid, yellowish, very fœtid discharge from vagina. No hæmorrhage.

2*nd December.*—Profuse discharge of blood from vagina during defecation. Checked by pressure of fingers in the vagina and rectum. Professor Simpson constricted the base of the tumour by two pairs of dressing forceps, the handles of which were kept in apposition by silver wire wrapped round them. Silver wire sutures were then passed below the tumour, which was then removed by the knife. The edges of the wound in the vagina were brought into accurate apposition by the silver wire, and dressed with powdered iodoform.

11*th December.*—Stitches removed. Incision healed, and looking quite healthy.

19*th December.*—Wound firmly cicatrized. Vaginal discharge quite ceased. Patient appears perfectly well, with the exception

of the general weakness due to the anæmic condition, produced by the loss of blood previous to the operation.

From 23rd to 31st December unfortunately hæmorrhage repeatedly recurred, at times very profusely. During this period the treatment consisted in the administration of hæmostatics and local plugging of the vagina, and may be summarized as an unsuccessful attempt to restrain the hæmorrhage, to which the patient eventually succumbed on the morning of 1st January 1885. No autopsy was allowed.

Viewed under the low power, the section of the tumour will be more conveniently described in two parts—superficial and deep. The superficial is almost entirely composed of cells of various size and shape, with numerous large and distended capillaries traversing its substance, with a few small hæmorrhagic extravasations here and there. In the deeper part, a few strands of non-striped muscular fibres and bloodvessels separated by large and extensive hæmorrhages are seen. In the Bismark brown stained specimen the characteristic cells of the tumour are brought out very clearly, at the expense, however, of its vascular arrangement. Under the high power (see Fig. 3) the tumour is seen to consist of large spindle-shaped and irregular cells, with large finely granular nuclei, infiltrating and separating bands of connective tissue. There are numerous capillaries running between the cells, the walls of which in some places are composed of a single layer of flattened connective tissue cells, whilst at other parts it seems to be absent. Here and there minute extravasations are seen. Many of the characteristic cells have undergone peculiar degenerative changes,—swelling, becoming more or less rounded and granular, the nucleus undergoing the same changes.

Tumours of the vagina are acknowledged by all writers upon gynecology to be extremely rare. Sarcoma as a lesion in this position has only been quite recently described, and the infrequency with which it occurs may be inferred when it is not even mentioned in such standard works upon diseases of women as those of Gaillard Thomas, Grailly Hewitt, and West and Duncan; while Emmet, in his recent work, says sarcoma "is seldom, if ever, found below the internal os." [1]

The points of interest in this case appear to me to be—

1. The age of the patient, viz., 19 years. This is an unusually early age for malignant disease to develop, though it is true cases of sarcoma vaginæ have been observed in children three or four years of age.[2]

2. The small size of the tumour—being about the size of a walnut—and its sloughing condition.

3. The rapidity of growth of the disease, as shown by the fact that the patient was dead fifteen weeks after the onset of the first

[1] *Principles and Practice of Gynecology*, p. 507.
[2] Sänger, *Arch. f. Gyn.*, B. xvi.; and *Centralbl. f. Medic.*, 1880.

symptoms, despite the amelioration following the operation; and the microscopic examination of the tumour was still further confirmatory of this point. Cases of sarcoma of the female generative organs seem prone to run a prolonged course.

CASE IV.—*Malignant Disease of the Recto-vaginal Septum. Aspiration of Tumour per Vaginam; temporary Relief; steady Advance of Disease; Patient still Living.*

M. F., æt. 42, widow, was admitted into Ward XXIV. on 28th April 1884, on the recommendation of Dr Maclagan of Berwick, complaining of a constant bloody discharge from the vagina, pain and difficulty of micturition, and obstinate constipation. Her illness commenced in June of 1883, when the menses lasted fourteen days, and at the conclusion of the period she became very costive, feeling as if "something prevented the passage" of the fæces, and at the same time suffered slight pain during micturition. These symptoms improved slightly during the month following, but her menstruation became very irregular—at first there being an interval of fourteen days between the periods, later on only seven days, and during the three months previous to admission there had been a hæmorrhagic discharge daily, at all times necessitating the wearing of a diaper. During the past six months there has been obstinate constipation and pain and difficulty of micturition, there being a sensation as if something prevented the excreta being voided.

On examination, the perineum is entire but much distended, and forming the apex of a large body which projects forwards into the vagina and backwards into the rectum. The examining finger, per vaginam, could not reach the cervix owing to the bulging forwards of the posterior vaginal wall, which is distended over a firm, smooth, non-sensitive mass, clearly limited laterally, and, as far as could be made out, superiorly. Through the rectum a similar body is felt bulging its anterior wall backwards. Recto-vaginal touch shows this mass to be lying in the recto-vaginal septum, and about the size of a small cocoa-nut.

On 30th April 1884, Professor Simpson aspirated the tumour per vaginam, and drew off 8 oz. of almost pure blood, which quickly clotted. Microscopically it consisted of blood corpuscles. Subsequently the dysuria passed away, and the constipation was somewhat relieved; the hæmorrhagic discharge, though continuing, was by no means as copious as before. Dismissed, 21st May, expressing herself greatly relieved.

On 29th September 1884 she was readmitted complaining of floodings, with shiverings and pain in the left side. She stated that two months after her departure floodings occurred every three weeks, the discharge continuing copiously for a week. Constipation always aggravated the discharge, and she therefore habitually took

aperients. The pain in the left side, which has lasted two months, has been worse of late. On physical examination, the condition of matters was almost precisely the same as on her first visit, with this exception—the perineum was not bulged, but there was a well-marked cluster of external piles.

On 10th October she was anæsthetized and examined; but after careful consideration, Professor Simpson determined that nothing of an operative nature could be done for her. The microscopic examination of the blood from the tumour showed spindle-shaped nucleated sarcomatous cells.

The subsequent treatment consisted in the regular administration of cascara sagrada for the obstinate constipation, gall and opium ointment locally for the piles, and occasional administration of anodynes to relieve pain. Micturition, at all times difficult, was frequently impossible, so that catheterization alone afforded relief.

Dismissed 13th November 1884. The mass in the septum somewhat enlarged. Since then I have not heard anything of her physical condition.

CASE V. — *Second Case of Sarcoma of the Recto-vaginal Septum. Laparotomy and Aspiration of Tumour; Growth of Tumour upwards into Abdomen; Aspiration per Vaginam; steady Advance of Disease; Patient still under observation.*

C. F., æt. 52, a widow, was admitted into Ward XXIV. on 12th October 1884, on the recommendation of Dr Freeland Barbour, complaining of pain and difficulty in the evacuation of the bowels and in making water, with occasional retention of urine, and a copious watery vaginal discharge for the last three weeks. Three weeks ago she suffered from retention of urine, which has recurred six times during that period, and at the same time noticed a dull gnawing pain in the back, especially on exertion. She menstruated last a year ago.

On examination, per abdomen, a firm, smooth, non-sensitive, movable body is felt in the right inguinal region, apparently the fundus uteri. On vaginal and rectal examinations, the condition is almost precisely similar to that felt in the last case (Case IV.), but the combined recto-vaginal touch reveals the lower $\frac{3}{4}$ of an inch of the septum unintruded upon by the tumour, which is firm, smooth, non-sensitive, and, roughly, about the size of a fœtal head, pressing anteriorly on the symphysis, and posteriorly on the sacrum.

As the condition was very similar to that in Case IV., it was determined to open the abdomen, to see if that would throw any light upon the diagnosis and treatment of the lesion. Accordingly on 20th October, chloroform having been administered, Professor Simpson made an incision in the middle line, through thick, vascular abdominal walls, till the peritoneum was exposed, which

was opened with scissors. The fundus uteri was seen raised upwards by a vascular-looking tumour, jammed in the pelvis, lying extra-peritoneally, and pushing upwards the pouch of Douglas (Fig. 4), which, on being tapped, yielded 12 oz. of dark blood, which, on

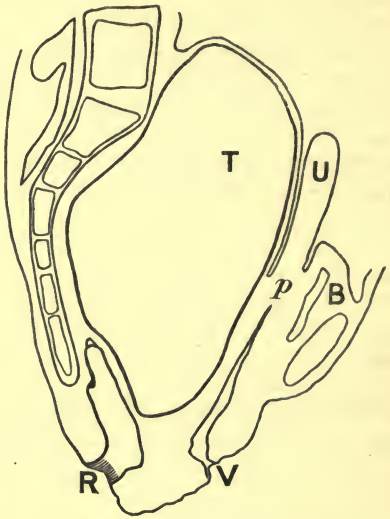

FIG. 4.—Diagram showing relations of tumour (probably sarcomatous) to the pelvic organs. T, tumour; U, uterus; R, rectum; V, vagina; B, bladder; *p* is opposite peritoneum of the pouch of Douglas. The tumour is sub-peritoneal, and pushes the peritoneum of the pouch of Douglas upwards and forwards.

microscopic examination, was seen to consist of red blood corpuscles and a few *nucleated* attenuated cells. The peritoneal cavity was thoroughly cleansed with carbolized sponges, the edges of the incision accurately adapted, a dry iodoform dressing applied, and secured by sticking-plaster.

Per vaginam (after operation).—The tumour is to touch considerably smaller.

The temperature never rose above 99°·2 F.; the stitches were removed on the seventh day, and the wound found to have firmly cicatrized. The patient was up and about on the eighteenth day.

11*th November to* 9*th December.*—Urine has to be drawn off almost continuously. At times can make water with great difficulty and much pain.

11*th December.*—A firm, smooth, tender mass felt, occupying the hypogastric, and extending into the right inguinal region, superiorly and to the right of which the uterine fundus is felt. Tumour aspirated per vaginam. Apparently quite solid and very vascular, as pretty profuse hæmorrhage followed the withdrawal of the aspiratory needle, which was checked by packing the vagina with iodoform gauze.

18*th December.*—Ordered extr. cascara sagrada fluid (30 ♏ bis in die) for obstinate constipation.

15*th January.*—Since admission a watery, non-offensive discharge continues daily, though not profusely. Catheterization frequently necessary.

Per abdomen.—A somewhat irregular, hard, tender mass felt, extending upwards to about 2 inches from the umbilicus, surmounted by the uterine fundus as before. No bruit heard.

Per vaginam.—The tumour has a distinctly nodulated surface, extending from about an inch from the vaginal aperture upwards as far as the finger can reach.

19*th January.*—Dismissed with injunctions to continue the cascara sagrada (30 ♏ ter. in die).

10*th April.*—Has had much pain in the back and pelvis generally during the past two months; worse at night; relieved only by anodynes. At first paroxysmal, lately more continuous. During past month has had loss of power of right leg, and difficulty of walking.

28*th May.*—Much watery vaginal discharge during the past month,—still not offensive. Taking aperients and anodynes—the latter in increasing doses—habitually. There has been no retention of urine since March last. Has become much emaciated. Uterine fundus fell just below level of, and 2 inches to the right of, the umbilicus, raised upwards by the tumour, which has reached a level about 1 inch from the umbilicus. On its vaginal aspect the nodulated character of the swelling is still maintained.

These two cases (*i.e.*, Cases IV. and V.) are almost unique; for on a review of gynecological literature, I am able to find only one reference to this lesion in this position, viz., Primary Sarcoma of the Recto-vaginal Septum. This single case, briefly related by Dr P. F. Mundé,[1] is of such interest in this connexion, being so closely allied to the cases I have narrated, that I may be pardoned if I quote it in its entirety:—"A woman, 55 years of age, the mother of a number of children, had suffered from an enlargement of the abdomen, accompanied by pelvic pains, which during the past two months had become exceedingly severe. The tumour was very tender to the touch, and was found to lie in the recto-vaginal space, pressing the vagina forward and downward, and the rectum backward. It was tapped on two different occasions through the vagina, and a thick, bloody fluid, readily coagulable, was withdrawn, with a few flocculi of pus. The diagnosis lay between sarcoma with fluid contents and pelvic hematocele. After three weeks, the tumour slowly increasing in size in the meantime, signs of septic infection appeared, and an opening was made through the vagina, and fresh coagula were discharged. The walls of the cavity were found to consist of irregular soft masses, which could readily be scraped out with the vaginal depressor. Microscopic examination showed it to be a round-celled sarcoma, with

[1] *American Journal of Obstetrics*, vol. xvi. p. 946.

but little fibrous tissue. The temperature rose to 103°, and the patient died of exhaustion on the fifth day after the operation. Post-mortem examination showed that the disease was limited to the cellular tissue in the recto-uterine space, neither the uterus, the ovaries, nor any of the other organs in the pelvic cavity being in the least involved. He had not been able to find a similar case recorded in medical literature, although sarcoma of the uterus and of the ovaries was not uncommon."

I say that the two cases I have described were sarcoma, because I think the limited microscopic examination of the tumours we were able to make, point in both cases to sarcoma as the lesion; for in Case IV. spindle-shaped sarcomatous cells were distinctly seen in the blood, and in Case V. the *nucleated* attenuated character of some of the cells was very sarcomatous looking, and I only regret that at the time I did not have drawings made of the appearances. Further, that these tumours are undoubtedly malignant is, I think, abundantly supported by the clinical facts of the cases, and on a review of their history one is struck at once with the remarkable similarity of the clinical features, which may be summarized as follows:—

1. Both patients were of similar age—at the time of life when malignant disease is most prone to develop—viz., 42 and 50.

2. Bladder and rectal symptoms were the first to attract attention, viz., dysuria and retention of urine, together with constipation, both becoming aggravated on the advance of the lesion, and simply the results of pressure of the tumour.

3. Vaginal discharge—hæmorrhagic in Case IV., and watery in Case V.—non-offensive up to the present date, but always copious.

4. Pain, at first absent; later, becoming paroxysmal, and subsequently continuous, and relieved only by the regular administration of anodynes; in fact, just the character of the pain of malignant disease.

5. Still further, the steady advance of the disease, the aggravation of the symptoms, loss of flesh and cachetic appearance, which developed in these patients, are all in favour of a malignant neoplasm.

6. A remarkable similarity in the physical signs of the pelvis, the tumour being of the same consistence and in the same position primarily in both cases, though it is true in Case V. it subsequently became abdominal; and furthermore, its vaginal aspect came to have the nodulated feel of a malignant new growth. At first the contents of the tumours are fluid to some extent, for they can be withdrawn by aspiration; but subsequently they become quite solid, and the only effect of aspiration is to create smart hæmorrhage. The fluidity of the tumour at an early date was most probably owing to the fact that a portion of it was cystic—in fact, a cysto-sarcoma—and that hæmorrhage had occurred from the lining of the cyst wall. One might readily understand the occurrence of hæmorrhage in these cases, for during the act of defecation

(especially in the existence of obstinate constipation, as in both these patients), the pressure of the bowel contents from behind, and the increased intra-abdominal force from above, would be quite sufficient to account for the rupture of badly supported vessels at their weakest points, which, even if only capillary oozing resulted, would in time suffice to fill a cavity such as I venture to think existed. Or, yet again, the fluid contents may have simply been the result of considerable blood extravasation into the midst of a solid tumour, which had a more loosely constructed centre. Or, it is possible, though quite improbable, that there was a cyst formation primarily, and a secondary sarcomatous growth around it, which, after invading the cyst wall, would allow capillary oozing to take place into the previous cystic contents for the mechanical reasons just mentioned. The subsequent solidity was simply the result of the removal of the fluid contents, collapse of the walls around, and possibly some increased cell proliferation from the irritant action of the aspiratory needle. These are, of course, mere theories—to my mind, plausible—though quite subservient to facts. The fluidity of the tumour does not prevent its being sarcomatous, for in the only case on record, we know there was an abundance of fluid contents.

The differential diagnosis requires to be made from two lesions —hæmatoma and carcinoma. Cases of hæmatoma in the recto-vaginal septum are very rare, though (1), the displacement of organs produced in Case V., the uterus being raised upwards into the right inguinal region; (2), the hard feeling of the tumour; and (3), the pressure symptoms resulting—dysuria, retention of urine, and constipation—were all in favour of this view. But in Case V. the patient had passed the menopause, and the prolonged subsequent history of both cases makes this view quite untenable, as absorption of the swelling or suppuration in it would have occurred.

These cases were not carcinomatous in their nature for two reasons—(1), there was never any evidence of ulceration in these tumours; and (2), there was a total absence of secondary deposits. Both of these changes would have occurred if the lesion had been cancerous.

The treatment most advisable would appear undoubtedly to be aspiration of the tumour per vaginam (using every antiseptic precaution), as this accomplishes all that can be done by any operative procedure; for although there is very little danger following the abdominal section, its adoption cannot furnish us with any further reduction of the tumour. The plan followed by Dr Mundé in his case of making an opening into the tumour through the vagina and scraping out its interior did not have a favourable termination, probably because a septic condition arose before the operation, which was quite sufficient to justify its adoption. The relief thus given by any operative procedure is not very encouraging; and later on, when the symptoms become aggravated, they

must be treated as in malignant disease generally, by anodynes. The obstinate constipation was best met by the constant use of cascara sagrada in gradually increasing doses.

Dr Underhill congratulated Dr Simmons on the elaborate and beautifully illustrated paper which he had presented to the Society as his first effort.

Dr Craig was interested to know that primary sarcoma of the vagina was rare. He had at present under his care a case of primary sarcoma of the vagina which had been seen by Professor Simpson, and who had no doubt as to its character. The disease had now involved the vaginal wall all round. There was profuse hæmorrhage.

Dr Barbour congratulated Dr Simmons on the success of his maiden effort. The amount of trouble represented can only be appreciated by those working at such subjects. Attention had been drawn to the great rapidity of the progress of the case of sarcoma. When the patient was admitted to the Infirmary the mass was the size of a gooseberry, and one could hardly believe that the hæmorrhage was due to this. The death seemed to be due to the seat of the growth having been in the vicinity of the venous plexuses, which, having been early implicated, gave rise to an amount of hæmorrhage to which the patient had succumbed. He had been called suddenly to see her on one occasion. The vagina had been plugged, and on examination he found that hæmorrhage had occurred behind the plug, and was distending the vagina up to the level of the umbilicus. The other case was seen at an early period. The sketch (which he (Dr Barbour) handed round) showed the condition of the abdominal contents so far as they could be made out by vaginal examination. The examination *per rectum* gave the characters of a retro-vaginal hæmatocele, and suggested either a blood effusion or an ovarian tumour. The real relation of parts was only made out on abdominal section.

Dr Angus Macdonald was much pleased with Dr Simmons's paper. So far as his own experience went it agreed in the main with the statements in the paper. He has found sarcoma of the vagina a rare condition, but disagrees with Dr Simmons's opinion as to the rarity of epithelioma of the clitoris. He recalled one case in which an enormous epithelioma of the clitoris developed. The patient had concealed the existence of this for two years. The inguinal glands were involved. The mass was removed, and the patient lived for a year. In other two cases, women advanced in years, he removed the growths by the galvano-caustic wire and thermo-cautery. He had also another case, that of a fishwife from Newhaven, who suffered from epithelioma of clitoris. This was a typical example. After operation she did well for a time. In another case part of the clitoris, along with part of both labia minora and part of the urethra, were affected. He removed the

more superficial parts, as well as part of the urethra, and she did well for a year. He had seldom seen vaginal sarcoma, and cannot at the present moment recall any case. He would like to draw attention to another malignant condition of the canal, namely, adenoma of the cervical wall, and passing into the rectum. This variety bleeds freely. When he saw it in one case, on examination he broke off one piece by the vagina and another by the rectum. Another case was sent him by Dr Hunter. The patient was pregnant, and he found in this case a well-marked example of adenoma of the cervix. He did not get the subsequent history. He wished to congratulate Dr Simmons on his excellent paper.

Mr Skene Keith remarked that he had seen cases of epithelioma arising primarily from the clitoris, and also from the anterior and posterior vaginal walls.

Dr Peter Young had one case of sarcoma in which the vagina was involved all round. The canal was so much contracted as scarcely to admit the finger. There was much vesical and rectal tenesmus. The patient was 70 years of age. There was no hæmorrhage.

Dr Underhill asked if the diagnosis could be made clinically, that is, apart from histological structure. He mentioned a case of a young lady in whom a rapid development of a soft friable hæmorrhagic mass occurred in the vagina. It rapidly broke down and gave rise to an intensely fœtid discharge. The patient succumbed in six months. Was this without question a case of sarcoma arising in vagina?

Dr Foulis remarked that we had heard a great deal lately of the terms sarcoma, carcinoma, etc. It is undoubtedly the case that a distinction must be drawn between tumours which we call malignant from a clinical as distinguished from a histological point of view. It was difficult to understand how carcinoma can come to be developed in the wall of the uterus. The uterus being developed from the Müllerian ducts can have no connexion with the epithelial cells necessary to give rise to carcinoma. He feels that a knowledge of these tumours ought to rest on a more definite embryological basis than they do at present.

Dr Simmons thanked the Fellows for their reception of his paper. He apologized for omitting to mention the great hæmorrhage which occurred behind the plug in the case to which Dr Barbour referred. He did not understand whether or not Dr Macdonald removed the glands in the first case of epithelium of the clitoris on which he operated. He felt doubtful if Dr Young's case was one of primary sarcoma at all, as from the contraction of the vagina it was evidently impossible to determine the state of matters by examination.

In reply to Dr Underhill, he was not sure if the clinical history could be relied on for diagnosis, but the enlargement of the inguinal glands was greatly in favour of carcinoma.

VI. PATHOLOGY OF POST-PARTUM UTERUS:—1. Puerperal Septicæmia; 2. Adherent Membranes.

By A. H. Freeland Barbour, M.D., Assistant to the Professor of Midwifery and the Diseases of Women.

The two following pathological conditions in the post-partum uterus seem worthy of special consideration by the Obstetrical Society.

1. Puerperal Septicæmia.

For the clinical facts of the following case I am indebted to Dr Simmons's report in the ward journal:—

H. F., æt. 18, i.-para, was confined on 2nd December 1884 of a male child after a comparatively easy labour. She stoutly opposed all attempts of her medical attendants and nurses to douche out the vagina after delivery. On the fourth and fifth days of the puerperium, she was treated by means of hot poultices and morphia for what appeared to be an attack of peritonitis. This was completely recovered from, and she was quite well for a couple of days. On the ninth day after delivery, her medical attendant found her with a temperature of 105°; there was much tenderness on the right side, and the uterus was much enlarged. On the same night she was removed to the Buchanan Ward of the Royal Infirmary.

Condition on Admission.—Expression of face, anxious; malar flush, well marked; alæ nasi, working rapidly; lips, markedly cyanotic; . . . . pulse, 146, small, thready, regular, at times imperceptible; temperature, 105°. Abdominal walls, tense, with great tenderness on pressure; uterus felt as a firm, rounded, tender body extending to within half an inch of the umbilicus and freely movable. No deposit could be felt in the pelvis. Percussion note tympanitic, except over the uterus. . . . . On vaginal examination there was nothing worthy of note, except that the os was widely patulous, admitting the tips of two fingers. The bimanual showed the uterus to be much enlarged, extending to within half an inch of the umbilicus, and freely movable; there was no deposit in the pelvis. The douche-tube passed into the uterine cavity 4½ inches. The case was diagnosed as one of puerperal fever with some pulmonary œdema.

Treatment and Progress.—The uterus was douched out twice daily with antiseptics. Its volume was diminished to 3 inches. Under quinine and applications of ice, the temperature fell on one occasion to 103°. It was usually above this. She died on the third day after admission.

The post-mortem was made on the day after death. The following is Dr Byrom Bramwell's report:—

External Appearance.—Rigor mortis absent; lividity very great; venous mottling of the neck and limbs; several purple discolorations in the abdomen and other parts of the body; some herpetic eruptions on the face.

Thorax.—The left pleural sac contained 3 oz. of blood-stained serum; the right, very adherent. The right lung weighed 1 lb. 2 oz.; appeared to be markedly œdematous; lower lobe congested. The left lung weighed 13 oz., and was somewhat œdematous. The pericardial sac contained 2 oz. of blood-stained serum. The heart, which weighed 6 oz., was deeply blood-stained and very flaccid, but otherwise normal.

Abdomen.—The bladder was considerably distended. The uterus large, its fundus reaching the umbilicus. There was no peritonitis. The spleen

weighed 14 oz., was very soft and diffluent. The kidneys weighed—right, 6 oz. ; left, 5 oz. : both were soft and flabby. Liver weighed 2 lbs. 6 oz., and was very soft and flabby. The uterus was large and showed putrefactive masses adherent to its cavity ; sinuses in its walls dilated, and apparently containing clots and unhealthy secretion.

Note.—The appearances were those of *septicæmia.*

At the post-mortem, I obtained the pelvic contents and also portions of the other organs.

With regard to the naked-eye appearance of the pelvic organs, the most note-worthy feature was the *absence of any indications of peritonitis.* It is mentioned above that there was no general peritonitis; there was also no local peritonitis in the pelvis. The Fallopian tubes and ovaries were apparently normal; there was no purulent matter present in them. There was also *no marked affection of the cellular tissue.* The broad ligaments were not thickened by inflammatory deposit; the cellular tissue round the cervix was soft and œdematous, but showed no evidence of suppuration.

Portions of the uterus, pelvic cellular tissue, broad ligament, kidney, spleen, liver, and heart-wall, were put at once into alcohol to be examined for micro-organisms.

The spleen was too much disintegrated to cut; but the uterus, kidney, and heart all showed micro-organisms. Some of the sections are reproduced in the accompanying Plate (Figs. 1 to 3). They are stained with gentian violet according to Gram's method.[1] The groups of micro-organisms appear of a reddish purple, the rest of the tissue remaining grayish yellow.

Fig. 2 is a section of the kidney (×50). Here and there the vessels in a Malpighian tuft are seen to be plugged with micro-organisms, as are sometimes also the afferent and efferent vessels of the tuft. There are no abscess cavities in the kidney, nor any indications of inflammatory change round the affected tufts.

Fig. 3 is a section of the heart-wall (×350). In it we have a most beautiful demonstration of the bloodvessel running longitudinally, and then divided transversely, with a plug of micro-organisms filling its lumen. In the heart-wall the plugs are not so numerous as in the kidney; I cut and mounted several sections before I came upon them.

Fig. 1 shows a section of a vessel in the placental site (oil immersion, ×700). Here we see the exact nature of these plugs: they are composed of micrococci aggregated together. They are pretty numerous in the bloodvessels of the placental site, and also in the uterine wall. They fill the lumina of smaller vessels; and,

[1] In staining by this method, the sections are put first in a solution of gentian violet for about five minutes, then washed in alcohol, and afterwards in a solution (of iodine 10, iodide of potassium 20, water 3000) until the section becomes of a purplish-red colour. It is then washed again in alcohol, to take out most of the colour, then cleared up in oil of cloves, and finally mounted in Canada balsam liquefied by heat.

in the larger ones, appear as patches in the centre of blood-clot or of granular *debris*. In some sections where the micrococci are isolated one can see that they are disposed in chains of from three or four members and upwards; these chains have a sigmoid or tortuous disposition like dry vermicelli.

The sections of the cellular tissue and broad ligament showed nothing worthy of note. I made them to see if one could trace the micrococci through the lymphatics, but I could not do this.

We have here to do with a case where well-marked symptoms of septicæmia appeared on the eighth or ninth day of the puerperium, and proved fatal on the twelfth. It is possible that the attack on the fourth and fifth days, from which the report says she completely recovered, was the commencement of the process. We have also micrococci found in the various organs of the body, and the question is, Is there any relation between these and the disease?

Against the possibility that the micrococci were developed after death, are the facts that they are found in various organs of the body, and that when found they are present only in the blood-vessels, and just as we should expect to find them (most frequently in the smallest vessels, and sometimes just beyond the bifurcation of a vessel), if they were carried by the circulation. Unfortunately the blood was not examined during life. As to their origin, in the absence of endocarditis and of any evident source of septic material in the other organs of the body, we can refer it only to the septic changes in the uterus.

With regard to the interesting question of how they passed into the circulation, we note that in the case of the uterus there are three modes of septic infection—

(1.) *Absorption by the lymphatic system.*—This is by far the commonest. Of the localized effects of this, we see illustrations every day in cellulitis (or parametritis) after labour. It is quite possible that it may be shown that localized inflammation of the pelvic cellular tissue is in all cases of a septic origin, and that our knowledge of it will yet rest on as definite a pathological basis as our knowledge of erysipelas now does.

(2.) *Extension of septic changes along the mucous membrane of the Fallopian tubes into the abdominal cavity.*—Of this the typical instance is gonorrhœal inflammation. This, of course, affects the lymphatic system also, as we see in the enlarged inguinal glands; but the most permanent effects in the female are due to the extension of the inflammation (spread of the gonococcus?) along the mucous membrane of the Fallopian tube into the peritoneal cavity.

(3.) *Direct passage of the septic matter into the circulation.*—We say *direct*, because in both (1.) and (2.) the septic matter may ultimately pass into the circulation and cause metastatic abscesses. The puerperal uterus presents conditions which are

peculiarly favourable for this. The veins close by thrombosis; and should these large thrombi become septic, we may have an enormous quantity of toxic material rapidly thrown into the circulation.

The last (3.) seems the most probable mode of infection in this case. The absence of marked inflammatory changes in the cellular tissue, the peritoneum, and Fallopian tubes, is against the occurrence of (1.) or (2.).

To understand the present state of our knowledge as to *the relation of micro-organisms to puerperal septicæmia*, we must review the literature of the subject. It is in this direction that we must look for a solution of the much-vexed question of puerperal fever; and until we have, as the basis of our knowledge, firm pathological facts instead of fluctuating views and theories, the question as to its nature and treatment will remain *sub lite*.

Historical Résumé.

As the literature up to 1880 is fully given by Doléris[1] (to whose admirable monograph, as well as the papers by Lusk,[2] and the more recent one by Lomer,[3] reference should be made), we give here abstracts only of the more important papers which have appeared since that date. The beautiful work on Pathological Mycology by Woodhead and Hare gives an exhaustive bibliography of pyæmia and allied conditions.

Attention was first directed to the subject, in 1869, by the discovery, about the same time, by *Coze* and *Feltz*,[4] and by *Mayerhofer*,[5] of micro-organisms in cases of puerperal fever. The former found them in the blood, the latter in pus from the pleural and peritoneal cavities. Other investigators have since found them not only in the blood and in pleural and peritoneal exudations, but also in the heart, kidney, ventricles of the brain, as well as in abscesses of the uterine wall, the joints, and the brain. The mode of spreading has also been noted; they have been traced from the diphtheritic lining of the endometrium through the lymphatics into the peritoneal cavity, and also through the lymphatics of the diaphragm.

Pasteur[6] reports on his observations of seven cases of puerperal fever. In Case I., while the cultivation of a drop of blood drawn four days before death was sterile, that drawn eighteen hours before

[1] *La fièvre puerpérale et les organismes inférieurs pathogénie et thérapeutique des accidents infectieux des suites de couches.* Baillière et Fils, Paris, 1880.

[2] *Trans. of the Inter. Med. Cong.*, 1876.

[3] "Our present Knowledge of the Relations between Micro-Organisms and Puerperal Fever," *Amer. Journ. Obstet.*, July 1884.

[4] *Gazette Méd. de Strassburg*, 1869, p. 30.

[5] *Monatsch. f. Geb.*, vol. xxv., 1869, p. 129.

[6] "De l'extension de la théorie des germes à l'étiologie de quelques maladies communes— Sur la fièvre puerpérale," *Comptes Rendues*, tom. xc. p. 1038, 1880.

death was fertile and showed micrococci in short chains: post-mortem, the pus from the uterus, tubes, lymphatics, and peritoneum, as well as the blood, showed a similar micrococcus. In Case II. the cultivation of blood and pus, removed post-mortem, gave a similar micrococcus. In Case III. the cultivation of the milk gave the same form, while that of the lochia gave the Vibrion Pyogénique. In Case IV. the cultivation of the blood removed just before death was sterile, while that from an abscess in the arm gave the micrococcus: post-mortem, it was obtained from cultivations of the blood and of abscesses in the uterus and knee-joints. In Case V. the cultivation of the mother's blood was always sterile, while that of the infant gave the Vibrion Pyogénique: post-mortem, the same form was found in an abscess in the mother's liver, and was cultivated from the hepatic tissue. In Case VI. cultivation of blood during life was sterile: post-mortem, that of purulent pleuritic exudation gave the micrococcus. In Case VII., in which puerperal fever was feared, no organisms were found in the lochia or blood, and the patient ultimately recovered.

Doléris[1] gives a large series of observations on the lochia and on cases of puerperal fever, with results of numerous cultivation and inoculation experiments. *With regard to the lochia*, he gives in detail twenty-one observations out of a total of 200 which he made in 108 cases. Of fourteen observations on the lochia in normal cases, in six only were there no organisms present. In every one of the seven abnormal cases organisms were found and very abundant. He figures the various forms found in the normal cases, and also those taken from three of the abnormal ones. Among the most frequent was the *Micrococcus Pyogénique*, which Pasteur considers characteristic of suppuration. It consists of two points well defined and joined together, appears generally on the third or fourth day, and is the same as that called Diplococcus by other observers. The *Chain form* and *Bacteria* were sometimes present along with it; also another microbe closely resembling the chain micrococcus, but larger in size (three or four times). This last occurs in twos, threes, and fours, rarely in longer chains; it is found only in very bad cases.

He further gives detailed accounts of twenty cases of *Puerperal Fever*, with full reports of post-mortem examination in most of them. He arranges them in four groups:—(1.) Acute Septicæmia, 2 cases; (2.) Pyæmia with Phlebitis, 7 cases; (3.) General Suppuration, 7 cases; (4.) Slow Pyæmia with progressive Suppuration, 4 cases. In the cases of Acute Septicæmia he found long bacilli and chain micrococci in the fluids after death. The blood was not examined during life. Cultivations from the tissues were fertile, and inoculation of guinea-pigs and rabbits proved fatal—bacilli being found in their tissues after death. In the cases of Pyæmia with Phlebitis, the cultivation of blood drawn before

[1] Op. cit.

death gave, in the majority of cases, the chain-like micrococci. There were also marked changes observed in the red blood corpuscles. Cultivation of the fluid obtained post-mortem gave bacilli and diplococci, in addition to the chain-like form. From the cases of General Suppuration he found in the blood a micrococcus larger than the usual form, which occurred in groups of two or three. In the cases of Slow Pyæmia with progressive suppuration (only one of which proved fatal), he found during life in the blood a small micrococcus in single and double numbers, and obtained from a cultivation in one case a chain-like form.

Chauveau[1] has experimented on rabbits, which he finds very susceptible to the poison, while guinea-pigs seem proof against it. He inoculated the former with pus taken from the peritoneal cavity of a patient who had died of puerperal septicæmia, and produced all the various forms of septicæmia—acute, subacute, and chronic. The action of the virus is not affected by the sex of the animal, nor by the coexistence of pregnancy, except that the peritoneum is more liable to inflame in the latter case. Its action is, however, influenced by the mode of inoculation. When introduced into the peritoneal cavity, death follows in five or six days: there is little congestion of the peritoneum, but marked effusion with false membranes and abundance of micrococci; the cutaneous lymphatics at the seat of injection are filled with pus. If death follows very soon (fifteen to twenty hours), there is no peritonitis, but the micrococci are found plentifully in the blood. When inoculated in the abdominal wall, the same result may follow but is not so constant. When in the veins, there are no inflammatory changes and death results from the general infection. Sometimes the septicæmia runs a very chronic course, death not occurring for eight or ten weeks. If the animal survives, it acquires immunity and cannot be killed by any subsequent inoculation. Immunity was also produced by inoculating with an attenuated virus—prepared by subjecting the matter to heat (50° C. for eight to twenty minutes); rabbits inoculated with this survived, and had subsequent immunity.

Frænkel[2] prepared a pure cultivation. The fluid was taken from the pelvis with an aspiratory needle under proper precautions, "The cultivation in gelatine appears as white bands, which under a low power are seen to consist of yellowish spheres; these last have a cloudy appearance which, under a high power, is resolved into the individual cocci. In a glass cell, with parallel walls, they appear like pieces of turf, with delicately twining stalks springing off from them; under a power of $\times 400$, these stalks are seen to consist of cocci set end to end. In some cases the gelatine liquefies." Guinea-pigs, mice, and rabbits were inoculated. The guinea-pigs were proof against it. The mice died, without exception,

[1] "Sur la septicémie puerpérale expérimentale" (Report of Société des Sciences Medicales de Lyon), *Archiv. de Tocolog.*, 1883, p. 52.

[2] "Ueber puerpérale peritonitis," *Deutsche Med. Wochensch.*, 1884, No. 14.

after subcutaneous injection of a large quantity; and showed post-mortem micrococci sparingly in the blood, but abundantly in the spleen,—the serous membranes not being affected. The rabbits were not at all, or only slightly, affected by subcutaneous injection. Injection into veins produced fever, and sometimes death, with micrococci in the blood and spleen, but usually no affection of the serous membranes. Injection into the pleura was almost always fatal with pleurisy and peritonitis, the exudations showing abundance of cocci. The blood from an animal thus inoculated seems to be much more active than the original pure cultivation; applied to skin wounds it produces an intense erysipelas. When infection takes place through the lymphatic system, the internal organs show only one form of microbe; when through the bloodvessels, there is a mixed infection. On subcutaneous inoculation of an animal with a fluid containing various forms, we find these different forms flourishing locally, but only one in the internal organs.

Lomer[1] reports on nine cases of puerperal fever. In three of those, only the chain-like form was found in the organs post-mortem; in three, various forms were present; and in the remaining three, the most careful examination post-mortem failed to discover any micro-organisms. In only one case of a great many examined were micrococci found in the blood before death, although they were detected in abscesses, and also in fluid taken from pemphigus vesicles. In only one case, also, was the cultivation successful. From pus taken from a parametritic abscess eight generations were obtained:—"In shape, the colonies were seen as small, white, round, lucid spots, arranged in the manner of rosary beads. Their increase was slow, and it was found that they could also be generated upon fresh potatoes, and that differences of temperature had no effect whatever upon them as regards their power of multiplying. Microscopically, they formed long chains, often twisted and united so as to form bundle-like masses,—the chains themselves, as regards form and length, being seemingly dependent upon the presence or absence of resistance in the surrounding medium. Thus, in fluids, it seems that they can grow to an unlimited length (in the peritoneal exudation they were of quite good length), while in the organs they are met with in groups or masses, and only where the tissue offers less resistance, as in the lumen of bloodvessels, can they again be traced in their chain-like form." In three cases examined there was no difference in the form of the micrococci, or in the manner of their increase and growth.

Arloing[2] has cultivated the virus from peritoneal pus in lochia up to several generations, and noticed specially the effect of change of media. His conclusions are the following– (1.) Micro-organ-

[1] Op. cit.

[2] "Contribution à l'étude de l'agent virulent de la septicémie puerpérale," *Comptes Rendues*, 1884, p. 1346.

isms cultivated in beef-fluids are more active than those taken from human serous fluids. (2.) When transferred to fluid prepared from chicken they lose their activity, but regain it when re-transferred to the beef-bouillon. (3.) Cultivations *in vacuo* and in carbonic acid are more active than those in oxygen or air. (4.) Elevation of temperature (+ 43°) diminishes their activity; a higher temperature (45° to 47°) keeps them sterile, although conserving their properties. (5.) Inoculation with the most virulent form causes poisoning without suppuration; with the less virulent, peritonitis; with the attenuated (prepared from chicken bouillon), slow changes ending in abscess formation.

Present State of Our Knowledge.

To comprehend fully the present condition of our knowledge of puerperal septicæmia,[1] we must go back to the suggestive paper by Sir James Y. Simpson "On the Analogy between Surgical and Puerperal Fever" (Simpson's Obstetrical Works, edited by Priestley and Storer, vol. ii. p. 19). More recent scientific investigation has worked along the lines of this analogy, and the results have proved that it rests on a sound pathological basis. These results promise to carry us further, and establish not only analogy but identity.

The next important step was the discovery by Pasteur, in 1857, of the lactic-acid ferment, which gave birth to the germ theory of disease. This theory found in the hands of Sir Joseph Lister its most fruitful application to surgery, and it was only one step further to carry it into the province of obstetrics. Nothing is more remarkable than the eagerness with which practical obstetricians have seized hold of the principles of antiseptic treatment laid down by Lister; the only misfortune is that our treatment has shot so far ahead of our pathological data that we may expect a reaction similar to what has occurred in the province of surgery. These data are, however, being slowly accumulated, mainly through the work of Pasteur and those who work under him.

In connexion with puerperal septicæmia, there have been various forms of germs described:—(1.) *Monococcus*, consisting of isolated points; (2.) *Diplococcus*, which Pasteur considers characteristic of the formation of pus, and which he calls M. Pyogénique; (3.) *Chains of Micrococci*, which consist of several members; when seen separately each chain is found disposed in irregular S-shaped curves; (4.) *Micrococci* arranged in chains similar to the last mentioned, but *larger in form;* (5.) *Rod-shaped Bacteria*. Of these, number three (3.) is the one which the majority of observers have described in connexion with puerperal fever, and which Lomer says has been found in all cases where it has been looked for. It

[1] We use the term Puerperal Septicæmia in preference to the more general term Puerperal Fever, as the latter has been employed to cover also other fevers complicating the puerperal condition.

is necessary to discriminate between the places where the microbes have been discovered, noting whether they have been found (*a*) in the blood during life, (*b*) in the discharge from the genital wounds, or (*c*) in the tissues after death. Results obtained from *b* (*i.e.*, examination of the lochia) must be taken with great caution, since it is impossible to prevent access of germ-laden air to the lochia, as we can do by an antiseptic dressing in the case of a surgical wound. The examination of the blood during life, taken in conjunction with that of the tissues after death, and with the cultivations taken from these, give more reliable results.

Although micro-organisms have been found pretty constantly in cases of septicæmia, we have not yet reached the complete demonstration of their relation to the disease that we have in the case of splenic fever. Koch has laid down these four conditions, which must be satisfied before etiological relationship can be asserted:—(1.) The micro-organism must be found in all cases of the disease, and in that disease only; (2.) It must be isolated and cultivated, and preserve its characteristics through a series of cultivations; (3.) Inoculation of a pure cultivation must produce in the inoculated animal the symptoms of the disease; (4.) The micro-organism must be found in the tissues of the inoculated animal, and in the same relation to them as in the original disease. We have seen that more than one form has been described, of which the most constant is the chain arrangement. Pasteur regards this as characteristic of the less grave form of septicæmia, while the rod-shaped form (Bactérie Septique) is found in cases of very acute septicæmia. The results of experimental inoculation of animals are still unsatisfactory, and this is not to be wondered at, for this mode of investigation has revealed two *very* serious difficulties,—(1) a variation in the susceptibility of different animals to the same poison, and (2) a variation in the activity of the poison according to the material in which it has been cultivated. May not these difficulties throw some light on puerperal fever? May there not be influences, yet to be discovered, determining on the one hand the *virulence of the poison*, and on the other the *susceptibility of the patient.* The immunity said to be produced in some animals by inoculation with an attenuated virus requires further investigation.

Although we must wait for further investigation to determine the exact relation of germs to septic poisoning, there has been established the very important facts that *we have the same pathological changes in puerperal as in surgical septicæmia, and that these hold exactly the same relation to the germ theory.* In most cases of puerperal fever we have simply to do with blood poisoning from unhealthy wounds, identical in pathology with the blood poisoning from an unhealthy condition of the wound after an amputation. The constitutional symptoms are, of course, modified by the puerperal condition, just as the local changes are affected by the peculiarities in the anatomical structure of the post-partum uterus—the condition

of the tissues lining its cavity, its enlarged veins and lymphatics, and its hypertrophied parametric tissue. In a former paper[1] I described the normal condition of the tissues in the post-partum uterus, and here we need only point out what a favourable soil the breaking down tissues of the placental site offer for the growth of micro-organisms, and how the removal of the epithelial covering from the whole of the interior of the uterus and cervix uteri favours septic absorption. That septic poisoning does not oftener occur is probably due to accurate apposition of the anterior and posterior vaginal walls (following the expulsion of the uterine contents), which prevents the entrance of germ-laden air, and also retards the growth of those organisms which, as Pasteur has shown, require air for their development. The fact that the epithelium of the vagina is not detached by the passage of the child is significant, as this will prevent septic absorption from taking place through its walls except when lacerated.

The practical conclusion from the foregoing is *that the condition of the interior of the uterus should occupy the same place in the mind of the obstetrician that the stump does in the mind of the surgeon.* The condition of the lochia gives valuable information as to the state of the uterine wound. We must remember, however, that we may have septic absorption going on without fœtor of the lochia, as we have seen in one case. We must distinguish between putrefying matter (which will, of course, produce fœtor) and septic matter: *all putrefaction within the uterus after delivery will cause septic poisoning, but not all septic poisoning implies putrefaction.* We have a pathological basis for this distinction in the difference between the microbes characteristic of putrefaction and those described in septicæmia.

The germ theory receives confirmation from the fact that those substances which have been shown to be most effective in destroying micro-organisms have proved most useful in treating septicæmia. It is established beyond question that the washing out of the uterus with antiseptics in cases of puerperal fever is followed by the most remarkable results. Till recent years carbolic acid was the favourite antiseptic, but corrosive sublimate possesses so many advantages that it is gradually replacing it. Koch's experiments have shown that the latter is much more destructive to microbes. The spores of Anthrax Bacillus would still grow after immersion for seven days in a 2 per cent. solution of carbolic acid, as also they did after immersion for a day in a 5 per cent. (1-20) solution. But after immersion in a solution of 1-10,000 of corrosive sublimate for from 5 to 60 minutes, the same spores became sterile; in fact, immersion for ten minutes in solutions up to 1-20,000 also sterilized the spores. He places the limit of the action of the

[1] "The Anatomy and Relations of the Uterus during the Third Stage of Labour and the First Days of the Puerperium," *Edinburgh Medical Journal*, Sept. and Oct. 1884.

sublimate on the spores of anthrax bacillus as lying somewhere between a 1-20,000 and a 1-50,000 solution. His experiments on mice were very interesting. Three spore-laden threads were dipped for ten minutes in solutions of 1-10,000, 1-20,000, 1-50,000 respectively, and then introduced beneath the skin of different mice. The 1-50,000 mouse died next day, as rapidly as if the spores had been fresh. The 1-20,000 one died on the fourth, the 1-10,000 on the fifth day. These last showed, therefore, an extraordinary prolongation of the period of incubation which may fairly be attributed to the action of the sublimate. The same experiment was repeated with the difference that the spores lay for one hour instead of ten minutes in the solutions. The 1-50,000 mouse died in forty hours; the 1-20,000 mouse died in three and a half days; the 1-10,000 mouse survived. "Sublimate is, therefore, the only one of all recognised antiseptics which possesses the very important peculiarity, that it kills by a single application of a comparatively weak (1-1000) solution for a few minutes all, even the most resistant, spores of micro-organisms; even with a solution of 1-5000, a single dipping was sufficient."

Another advantage of the corrosive sublimate is its portability. Owing to its solubility in the presence of chloride of ammonium we can have a very concentrated solution. At Dr Hart's suggestion, Messrs Duncan & Flockhart have prepared a solution of 16 per cent.; so that one drachm added to a quart of water gives a solution of 1 in 2000, which is an efficient antiseptic. It is made up in special bottles provided with a glass cup of one drachm capacity fixed to the cork. Those engaged in obstetric practice will find it a great convenience, as it can easily be carried, and can also be ordered for use by the nurse where it is desirable to have antiseptic injections given daily during the puerperium. A great deal has been said against corrosive sublimate owing to toxic effects which have followed in a few cases. Koch has, however, pointed out that its action on germs is so rapid that long immersion is not necessary. The practical application of this is that in cases where we might be afraid of too much absorption of the sublimate an injection of water might be given immediately after the antiseptic one without diminishing the effect of the latter. After a vaginal injection given in the dorsal posture, a considerable quantity of fluid may remain in the vagina so long as the patient remains in that posture. This fact and the lacerated condition of the cervix may explain the absorption with toxic results which has sometimes been observed. The 1 to 2000 solution is now widely used in this country, and we have never heard of any bad effects.

2. Adherent Membranes.

The following case of retention of a portion of the membranes throws light on the nature of this condition, about which very

little at present is known. The clinical history of this case has been already brought before the Society in Dr Ballantyne's recent valuable contribution to its *Transactions* on "Sphygmographic Tracings in Puerperal Eclampsia;" I recapitulate only the points that interest us here.

M. S., æt. 18, i.-para, was seized with eclampsia at the seventh month; she had enjoyed good health previously. Labour came on spontaneously, and, though tedious, was terminated naturally within twenty-four hours; the membranes ruptured early—before the os was much dilated. The placenta was expressed by Credé's method half an hour after the birth of the child. The placenta was expressed without difficulty; but it was not noted whether at the time any portion of membranes was retained. Patient was comatose after delivery, and died in ten hours, or twenty-eight hours after the first eclamptic seizure.

In the report of the post-mortem examination, made by Dr Byrom Bramwell, there is nothing that interests us here except that there were the naked-eye appearances of renal disease, but no cardiac disease, nor signs of sepsis or peritonitis in the abdomen.

I obtained the uterus for special examination, and found the following condition. Externally it measured $6\frac{1}{2}$ inches in length, and although flabby, shows nothing worthy of note; ovaries and tubes apparently normal; no inflammatory deposit in broad ligaments. On laying it open, the cavity measures 6 inches from os externum to fundus; of this the lower $1\frac{1}{2}$ inches is of a purplish-red colour (which contrasts with the mottled red appearance of the uterine cavity above it), and represents the cervix. The anterior and posterior walls measure 3 inches across at their widest part. The surface of the cavity of the body of the uterus presents three distinct appearances: on the posterior wall is an area (3×3 in.) which is ragged and of a purplish colour—the placental site; the upper third of the anterior wall is smoother and paler than the rest of the cavity, which has a mottled appearance, due to little shreds of brick-red tissue adhering to it. The smooth appearance of the wall is evidently due to its being lined by a membrane which ends in a fringe; on stripping it off, one produces the mottled appearance which characterizes the parts where the membrane is not present.

For microscopic examination portions were cut from the cervix, from the wall of the uterine cavity where the membranes were stripped off, and from the same where they were adherent. The sections of the cervix show that the epithelium is absent on the surface, but present in some glandular spaces below it, and that the superficial layers of tissue are broken up with recent hæmorrhages. Sections of the uterine cavity where the membranes are stripped off show a layer of decidua about 1–2 mm. thick covering the muscular wall. In those made where the membranes are adherent we observe the following points. In the lower part[1] is the muscular wall. In the upper part, to the left, the membrane is adherent to the free

[1] Microscopic sections were exhibited to the Society.

surface of the uterus; to the right, it has been stripped off. Where it is adherent the decidua is broken up with hæmorrhages; these hæmorrhages are not recent, as is shown by the blood pigment in them and the tissue changes round them. Round these hæmorrhages the structure of the decidua is quite altered; in some places a layer of homogeneous condensed tissue takes the place of the cells, in others young connective tissue is forming. By young connective tissue I mean fibrous tissue; for the decidua is itself a connective tissue, as the decidual cells are the result, not of a metamorphosis of the epithelium lining the uterine glands, but of the interglandular connective tissue corpuscles. It is interesting to note that there is a narrow strip of tissue along the free edge of the uterine cavity into which these hæmorrhages do not extend; in some cases you see them stopping sharply at it and pushing it up instead of penetrating it. This strip of tissue is, I believe, the chorion, and its behaviour corresponds to its non-vascular character.

In summing up the points of interest in this preparation, we note the following. The uterine cavity (ten hours after delivery) measures 6 inches in length. In the two specimens described in a former paper, it was 6½ inches (40 hours post-partum), and 7 inches (48 hours post-partum), respectively. The shorter length in this case may be explained by the fact that labour occurred at the seventh month. The chorion and decidua have remained adherent to the uterine wall over a considerable area. If we had not these microscopic specimens, some one might have attributed this to the use of Credé's method of delivering the placenta, although the report says it was not had recourse to till half an hour after delivery, and that the placenta came away easily. Or it might have been attributed to the fact that labour occurred at the seventh month, although there is no evident reason why the membranes should separate with greater difficulty then than at the ninth month. These microscopic preparations, however, give us an intelligible reason why the decidua should not have separated here as easily as in a normal case, seeing that that membrane has been the seat of inflammatory changes attended with hæmorrhages. As to the cause of this inflammatory condition in the decidua, we have no data to reason upon. The hæmorrhages are of too long standing to have arisen since the eclampsia developed (28 hours before death), and there is no history of symptoms before this which throw light on the case.

As to the literature of this subject, I have not been able to find any on the causation of retention of the membranes. Küstner has made some important observations on the result of their retention, and assigns to this a special role in the etiology of endometritis.

The hour being late, there was no discussion.

VII. REPORT OF THE ROYAL MATERNITY AND SIMPSON MEMORIAL HOSPITAL, FOR THE QUARTER ENDING 30TH APRIL 1885.

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EXTERN CASES.

The number of cases reported during the quarter was 141. Of these 120 were multiparæ, and 21 primiparæ.

Presentations.—Vertex, 123; breech, 5; transverse, 1. There were 6 abortions occurring between the second and sixth months, and 3 cases of twins. In the remainder the presentation was unascertained.

Positions.—Of the vertex cases—L.O.A., 107; R.O.P., 13; R.O.A., 3; L.O.P., 0. Of the breech cases, 3 were L.S.A.; 2 L.S.P. The position of the transverse was dorso-anterior. Right cephalo-iliac. Of the cases of twins, in all the first child presented vertex L.O.A., and the second the breech.

Sex of Children.—Males, 68; females, 75. Sex not defined in 3 abortions.

Classification of Labours.—Natural, 123; laborious, 2; preternatural, 6; complex, 4.

In both the *laborious* cases low forceps were applied, in one case for delay in the second stage, and in the other for persistent occipito-posterior.

Of the *preternatural*, podalic version was performed in the case of transverse presentation; the mother did well, but the child was still-born, the cord having been prolapsed and pulseless for several hours. The cases of breech presentation offered no difficulty.

Complex.—These consisted of three cases of twins and one placenta prævia; in the last podalic version was performed. Both mother and child did well.

Mortality.—Maternal, none; fœtal, 7; infantile, 10, due to premature birth or unexplained causes.

In the case of one full-time male child, jaundice developed shortly after birth; there was constant vomiting, and no meconium or urine was passed. It became greatly emaciated, and died on the sixth day. A careful post-mortem examination was made. The stomach was found to be greatly distended, and attached to its pyloric end was what appeared to be the first part of the duodenum, enormously distended, being nearly equal in size to the stomach, and filling up the right hypochondrium. No communication existed between this and the second part of the duodenum, which ended in a blind extremity at the level of the upper border of the pancreas, and into it the pancreatic and common bile ducts

opened. The bile ducts were patent. The rest of the intestinal canal was normal.

Intern Cases.

During the quarter there were 78 cases delivered in the house.

Primiparæ, 41; *multiparæ*, 37. Of the multiparæ, 21 were delivered for the second time, 6 for the third time, 6 for the fourth time, 2 for the fifth time, and 1 for the eighth time.

Age.—The average age of the primiparæ was 22·5, the youngest 15, the oldest 35. The average age of the multiparæ was 25·7, youngest 18, oldest 39.

Average Duration of Labour.—In *primiparæ* was—1st stage, 15 hours; 2nd stage, 1 hour 55 minutes; 3rd stage, 15 minutes. In *multiparæ*—1st stage, 9 hours; 2nd stage, 1 hour 50 minutes; 3rd stage, 18 minutes.

In all cases, after waiting 15 minutes, Credé's method was employed for expressing the placenta. In one case, the placenta was firmly adherent to the uterus and had to be detached, and in 6 others there was some adhesion of the membranes.

Presentations.—The vertex presented in 76 cases, the position being L.O.A. in 59; R.O.P. in 7; R.O.A. in 2; L.O.P. in 1. Of the remaining 7 cases of vertex presentation, 3 were abortions at the sixth month. In another craniotomy was performed, and 3 were extracted by version. In none of the latter had the head engaged. The presentation in one case was transverse. Right abdominal anterior. One case of twins occurred, both presenting vertex L.O.A.

Sex of Children.—Male, 33; female, 44; one abortion doubtful.

Weight.—The average weight of the full-time male children was 7 lb. 2 oz., the heaviest being 9 lb. 3 oz.; the lightest, 5 lb. 11 oz. The average weight of the full-time female children was 7 lb., the heaviest being 8 lb. 10 oz.; the lightest 5 lb. 6 oz. The average weight of the *placenta* was 1 lb. 5½ oz.; the heaviest was 2 lb. 3 oz.; the lightest 10 oz. The average length of the *cord* was 23¼ in.; the longest measured 40 in.; the shortest 16 inches.

Classification of Labours.—Natural, 60; laborious, 12; preternatural, 1; complex, 5; abortions, 4.

Of the *natural* cases, two might be considered precipitate labours, lasting 2¼ and 2½ hours respectively.

Laborious.—2 lingering; 9 instrumental, including 1 craniotomy and 1 version. One *lingering* labour was rendered so by delayed rotation of head, position R.O.P., and the other occurred in a primipara, æt. 31, L.O.A., from rigidity of the soft parts.

Forceps were applied eight times, and in all cases the low operation was performed.

(1.) Primipara, æt. 28, L.O.A. For imperfect rotation of large head; 2nd stage, 6 hours.

(2.) Primipara, æt. 22, L.O.A. For a similar cause; 2nd stage, 4 hours.

(3.) Primipara, æt. 22, L.O.A. For inertia uteri; 2nd stage, 4 hours.

(4.) Primipara, æt. 22, R.O.P. Incomplete rotation.

(5.) Primipara, æt. 28, L.O.A. For large size of head and uterine inertia.

(6.) Primipara, æt. 26, L.O.A. For similar cause.

(7.) ii.-para, æt. 21, L.O.A. For exhaustion from tedious labour.

(8.) Primipara, æt. 18, L.O.A. For tedious labour from early rupture of membranes.

In one *laborious* case, where the pelvis was flat, version was performed (see special report). In the remaining case craniotomy was performed for extreme pelvic contraction (see special report).

Preternatural.—The only preternatural case during the quarter was one of *transverse* presentation, in which the position was abdomino-anterio right cephalo-iliac. Patient was a iii.-para, æt. 26. In her first labour the child presented transversely, and was delivered by version. The second was complicated by placenta prævia, also requiring version. In the present instance Dr Underhill performed podalic version, and no difficulty was experienced in the operation. The child was large, weighing 8 lb. 5 oz. It was asphyxiated at birth, but recovered after half an hour's treatment.

Complex.—2 from eclampsia; 1 from advanced phthisis; 1 from cardiac disease; 1 case of twins.

The two cases of *eclampsia* are specially reported.

In the *phthisis* case the labour was easy, but the exhausted condition of the patient left her in a precarious condition for some days. She left the hospital, however, in much the same state as on admission, where she died six weeks afterwards.

The case *complicated with heart disease* (mitral regurgitation) offered no difficulty, the woman making a good recovery.

The *twins* were premature, at the seventh month; both presented vertex, L.O.A. The children were living but very weakly. They were of different sexes, and weighed 3 lb. 9 oz. each. The second child was born half an hour after the first. There was a single placenta, and both cords inserted at the margin on opposite sides. There were two separate sacs of membranes. Of the abortions, 3 were at the sixth month, were all decomposed, and showed marked evidence of syphilis. The other was at the seventh month, also syphilitic.

The *perineum was lacerated* more or less in 18 cases, 14 occurring in primiparæ. In none was the sphincter ani involved. All, with one exception, were quite healed on dismissal, strong catgut sutures being used in every case when the laceration was considerable.

In 3 cases there was some *post-partum hæmorrhage.* In none

was it excessive. In all it was easily checked by compression of the uterus, hot douche, and the administration of ergot.

A diffuse *erythematous eruption* occurred during the puerperium in two patients. They suffered no ill effects, and the rash disappeared in a few days. No satisfactory cause could be ascertained.

One patient had well-marked signs of *hereditary syphilis;* the child appeared to be perfectly healthy at birth, and well developed.

Ophthalmia Neonatorum.—During the whole quarter the eyes of all the children were treated at birth with ½ per cent. solution of nitrate of silver, and were washed twice daily for the first six days with a solution of carbolic acid—1 in 100. Two patients suffered from *gonorrhœa* prior to delivery. In the one case the child manifested no ophthalmia; in the other the disease was well marked, and an opacity of the cornea of one eye resulted. One other case occurred, in which no gonorrhœa was evident. The child recovered.

Infantile Peculiarities.—There was one case of single hare-lip, one case of hypospadias, and in one child the mammæ were enlarged and contained milk. There was also some discharge of blood from the vagina in the latter case.

Mortality.—(1.) Maternal, 1, in a case of convulsions with albuminuria (afterwards referred to). (2.) Infantile, 2, both born prematurely; one lived eight and the other ten hours. (3.) Fœtal, 6; 4 were abortions, 3 at the sixth, 1 at the seventh month; 1 at sixth month, where premature labour was induced (see report); 1 at full time, craniotomy performed (see report).

Antiseptics.—The antiseptic used during the quarter was a solution of corrosive sublimate, 1 in 2000. This was used both for washing out vagina and uterus. There were no apparent ill effects from the use of corrosive sublimate, except on one occasion, when its use probably induced a transient attack of diarrhœa.

The *temperatures* during the early days of the puerperium were highly satisfactory. In a few cases a transient elevation of temperature occurred towards the end of the second week, the cause of which was not ascertained.

The *amount of blood discharged* from the vagina during the first three hours after delivery (the blood being collected a quarter of an hour after the expulsion of the placenta) was ascertained in 36 cases. The average quantity was 2⅔ *ounces.* The greatest loss was 10 ounces, and in 3 cases there was no discharge at all.

The *heart* was carefully auscultated in 56 women, and in 21 of these there was a well-marked systolic bruit heard at the base; one of these was due to organic disease.

The following cases appear worthy of special notice:—

I.—*Dystocia due to Flat Rickety Pelvis; Delivery by Craniotomy.*

Mrs C., æt. 22, was admitted to the Maternity Hospital on 16th

Feb. 1885, at 2 P.M. She had been fourteen hours in labour, and was in a very exhausted condition. Forceps had been applied by a medical man before admission, but without success. She had well-marked general evidences of rickets, and the pelvic measurements were as follow:—Between iliac spines, 10½ in.; between iliac crests, 10 in.; external conjugate, 6 in.; diagonal conjugate, 3 in.; true conjugate, calculated to be not over 2¼ in. The cervix was fully dilated, the membranes ruptured, and the cord prolapsed and quite pulseless. The vertex *presented* high up above the brim, the head lying in the transverse diameter of the pelvis, with the occiput to the left. The sagittal suture was close to the sacral promontory. The anterior fontanelle was at a lower level than the posterior.

At 5 P.M. Dr Angus Macdonald proceeded to effect delivery. Chloroform was administered, and the skull was perforated in the right parietal bone. Portions of the vault of the skull were removed with the cranioclast and bone forceps, and afterwards the basilyst was introduced into the petrous portion of the temporal bone, and, after considerable difficulty, the head was extracted with the aid of the crotchet and supra-pubic pressure. The shoulders required forcible traction to make them pass the brim. The perineum was not lacerated. The child was a well-developed male, 19 inches in length, and weighing 6 lb. 7 oz. The patient bore the operation well, and was thoroughly douched after it with a solution of corrosive sublimate, 1 in 2000. She made an excellent recovery, the temperature never rising above 99°, and was discharged on the 2nd of March, fifteen days after the operation.

It should have been stated that this was her second pregnancy, and that she had been a patient in the Hospital before (in July 1883), when Dr Halliday Croom performed a similar operation. Dr Macdonald strongly advised the patient to undergo an operation for the removal of her ovaries, so as to preclude the chance of her having another pregnancy, as the birth of a living child at term *per vias naturales* was impossible. The patient, however, would not submit to any operation.

II.—*Case of Puerperal Eclampsia; Delivery by Version.*

J. H., æt. 22, primipara, was admitted to the Maternity, on 4th March 1885, suffering from puerperal convulsions. She had suffered from kidney disease six years ago, and her legs had shown a tendency to swell ever since. She appears to have had two fits a week previously, but no more until the morning of the day of her admission; they began then at 6 A.M., and up till 12.30 P.M., when she was brought to the Hospital, she had had six altogether. On *admission*, patient was in a semi-comatose condition, and very restless; œdema of both legs; pulse weak and compressible, 130 per minute; pupils contracted and insensible to light; respiration

rapid and laboured; temperature, 101°. The cervix uteri admitted two fingers. 40 grs. of chloral hydrate were injected per rectum at 1 P.M. At 1.30 P.M. she had another fit, during which inhalation of chloroform was given. After the fit $\frac{1}{6}$ gr. of pilocarpin was given subcutaneously, causing profuse perspiration. Chloral hydrate also repeated. At 2.45 P.M. she had another fit, and another at 3.15.

At 3.30 P.M. Dr Angus Macdonald decided to induce labour, inasmuch as the patient was losing strength steadily. The cervix was dilated with Barnes's bags, and podalic version performed. The child was well formed, and living, but asphyxiated. It, however, got quickly round, and cried lustily. Patient bore the operation well, and was ordered to have enemata of brandy and beef tea, dry cupping, and fomentations of infusion of digitalis over kidneys, and acetate of potash internally.

At 6 P.M. she had another fit; inhalation of chloroform given, and above treatment continued. Two other fits occurred at 7.45 and 8.45, but not so severe as those before delivery. Temp. 98°. All this time patient remained quite unconscious, and breathing stertorously. 6 oz. of smoky urine drawn off—highly albuminous. Twice during the night patient had slight convulsive attacks, but no fit. Above treatment continued. During the next day patient became partially conscious, and was able to swallow beef tea and other nourishment. Quantity of urine drawn off during the twenty-four hours was 28 oz. On 6th March patient was very much better, and quite conscious. Urine contained tube casts, and 2·86 grs. of albumen per oz.; urea, 7 grs. per oz.; quantity passed, 42 oz.

On 7th March she developed slight dulness at the apex of the left lung anteriorly, and over right base posteriorly, but under treatment this soon disappeared. Otherwise patient made an excellent recovery; the urine increased in quantity, the amount of albumen slowly diminished, and the œdema of the legs had quite disappeared when patient left the Hospital on 21st March, after a stay of eighteen days.

III.—*Dystocia due to Flat Rickety Pelvis; Delivery by Version.*

S. S., æt. 30, iv.-para, admitted 22nd March 1885. In 1873, after being two days in labour, she was delivered of her first child by craniotomy. Her second child was born eighteen months later, at the seventh month, labour quite easy. Two years ago she was delivered with difficulty of her third child, at full time, by forceps, some injury being done to the child's head. Measurements of the pelvis gave the following results:—Between iliac spines, $9\frac{1}{4}$ in.; between iliac crests, $10\frac{1}{4}$; external conjugate, $6\frac{1}{4}$; diagonal conjugate, $3\frac{7}{8}$, from which the true conjugate was inferred to be barely $3\frac{1}{8}$.

Patient first experienced labour pains about 10 P.M. on 24th March. At noon on 25th March they became stronger and more regular, continuing so during the day, and at 10 P.M. were occurring every five minutes. The os was then the size of a crown piece; bag of membranes formed, through which a loop of the cord could be felt, and the head lying loosely in the lower segment of the uterus, and not engaging. At 11 P.M. Dr Angus Macdonald proceeded to deliver by *podalic version*. The only difficulty experienced was in the passage of the head, which lay in the transverse diameter at the brim, occiput to the left, afterwards rotating as it passed the cavity of the pelvis. The child appeared to be about the eighth month, was asphyxiated at birth, but breathed freely after half an hour's vigorous treatment; it died, however, eight hours afterwards. For three days after delivery patient had slight pain over the uterus, but she did not complain after that, and left the Hospital on 8th April, quite well.

IV.—*Cases of Erythematous Eruption during Puerperium.*

1. J. R., æt. 20, was delivered of a healthy child on 22nd March, 1885, and continued well during first six days of puerperium. On the morning of 29th March she was found to have developed an erythematous rash on both cheeks, extending over the nose; also a diffuse redness over both arms, papillæ deeply injected, slightly elevated, and rough to the touch. A similar condition, though less marked, on the front of both legs. The eruption was not itching, and disappeared entirely on pressure. Fauces slightly injected. Tongue slightly furred; no glandular enlargement. Pulse 88; temp. 98°·0. Slight pain and increased frequency of micturition. Urine, sp. gr. 1020, slightly acid, reddish-yellow colour; copious light-yellow deposit (pus), and giving a dense white precipitate on addition of nitric acid and heat; quantity passed in twenty-four hours was 36 oz. Microscope showed pus cells and amorphous *débris;* no bacteria. Milk secretion and lochia normal. Bowels constipated. A vaginal douche of corrosive sublimate (1-2000) had been used twice daily. The rash disappeared in four days—tenth day of the puerperium.

2. M. W., æt. 30, was confined of a healthy child on 18th April 1885, and developed a similar eruption four days afterwards. It was especially prominent on the arms, buttocks, and outer side of thighs. No other abnormal symptoms. Both in this and the last case the perineum had been extensively ruptured, and a vaginal douche of corrosive sublimate (1-2000) was used daily. The rash disappeared in three days.

3. A third case was seen among the out cases, the eruption being essentially the same. A similar vaginal douche was used. The rash in this case remained for 5 days.

V.—*Case in which Premature Labour was induced for Convulsions at Sixth Month; with Albuminuria.*

M. M., æt. 25, iii.-para, was admitted to the Maternity on 26th April at 9.30 P.M. She had had two previous labours, both easy. The history of her present condition is as follows:—She had been ailing for two or three months past, complaining of headache and swelling of face and legs, but was never actually laid up. On Saturday night, 25th April, she went to bed, apparently in her usual health, and on the following morning, about 5 A.M., is said to have fallen out of bed in a fit and severely bruised her head on the left side against some article of furniture. She was replaced in bed in a stupid condition, and remained so all day, and is said to have had four other fits up till 8 P.M., when she was seen by the resident on duty (who, finding copious albumen in the urine, and signs of about seven months' pregnancy), advised her removal to the Maternity. On admission she was semi-comatose. Breathing laboured, 40 per minute. Pupils contracted equally, and reacted to light. Urine contained copious albumen (½). Pulse 120; temp. 99°·6. On vaginal examination the cervix uteri was about an inch long, and the os internum admitted the tip of the finger. The abdominal tumour reached to the umbilicus. No fœtal heart could be heard.

At 10.30 P.M. Dr Underhill, who was on duty for Dr Angus Macdonald during his absence from town, on being called to take care of the patient, asked for a consultation with Dr Croom, after which it was decided to induce labour to give patient what slight chance there was. Barnes's bags were introduced, but owing to the extreme rigidity of the cervix, dilatation could only be effected to the size of half a crown, the internal os resembling a thick ring of cartilage. A dead fœtus, apparently about the sixth month, was extracted by podalic version, great difficulty being experienced in getting the legs through the os, which lacerated and yielded as the trunk and head were born. There was copious hæmorrhage from the torn cervix after delivery, which was arrested by a catgut suture, the vagina being plugged with salicylic wool secured by a bandage. Brandy and subcutaneous injections of ether were given after the operation, but the patient never recovered consciousness, and gradually sank and died at 1.30 A.M. on the 27th.

The Autopsy, fifteen hours afterwards, showed the uterus well contracted, and a laceration of the cervix, about 1½-2 inches in length, running up into the body. Kidneys congested and fatty. Lungs œdematous, and a blod-clot in the sub-arachnoid space, corresponding in situation to the bruise externally. No fracture of the skull.

The above report, drawn out for me by my residents, Drs Male

and Helm, is so complete, and indeed exhaustive, that there is little left for me to add to it.

I have again to draw attention to the nearly complete absence of mortality during the quarter, which helps to set at rest all doubts about the sanitary capabilities of our new Hospital. The patient delivered by Dr Underhill was found by the *sectio* to be in such a condition that even had the accident at delivery not occurred she could not have recovered. Her case is the only fatal one in connexion with either the intern or the extern departments, the conjoined deliveries amounting to 219.

As a step towards establishing the exact amount of blood that may be expected to flow during the stage of deliverance, I caused, as above stated, a series of observations to be made of the amounts lost in what would be called perfectly normal cases, during three hours after the expulsion of the placenta and membranes, with the loss of blood accompanying that process. The amount, it will be noted, varies greatly. In some cases it is so small that it cannot be measured; in others it runs up to 10 oz. The average is $2\frac{2}{3}$ oz. I was led to make this observation from noticing the uncertainty in a case of post-partum hæmorrhage that sometimes arises after the uterus appears to contract well, in determining whether the amount of flow is still excessive or not. It would appear, then, on observation that it should not exceed 10 oz. during the first three hours after the completion of the third stage. Our experience during this quarter in regard to the use of perchloride of mercury as an antiseptic in midwifery is highly favourable to that substance. We found none of the serious evil effects from it that have been noticed occasionally on the Continent.

In concluding this satisfactory report, I have to acknowledge with sincere thanks the valuable assistance I have received from Drs Male and Helm, not only in drawing up this statement of the *res gestæ* in the Hospital during the quarter, which is indeed entirely their composition, but also in the medical work of the Institution throughout the period they were on duty.

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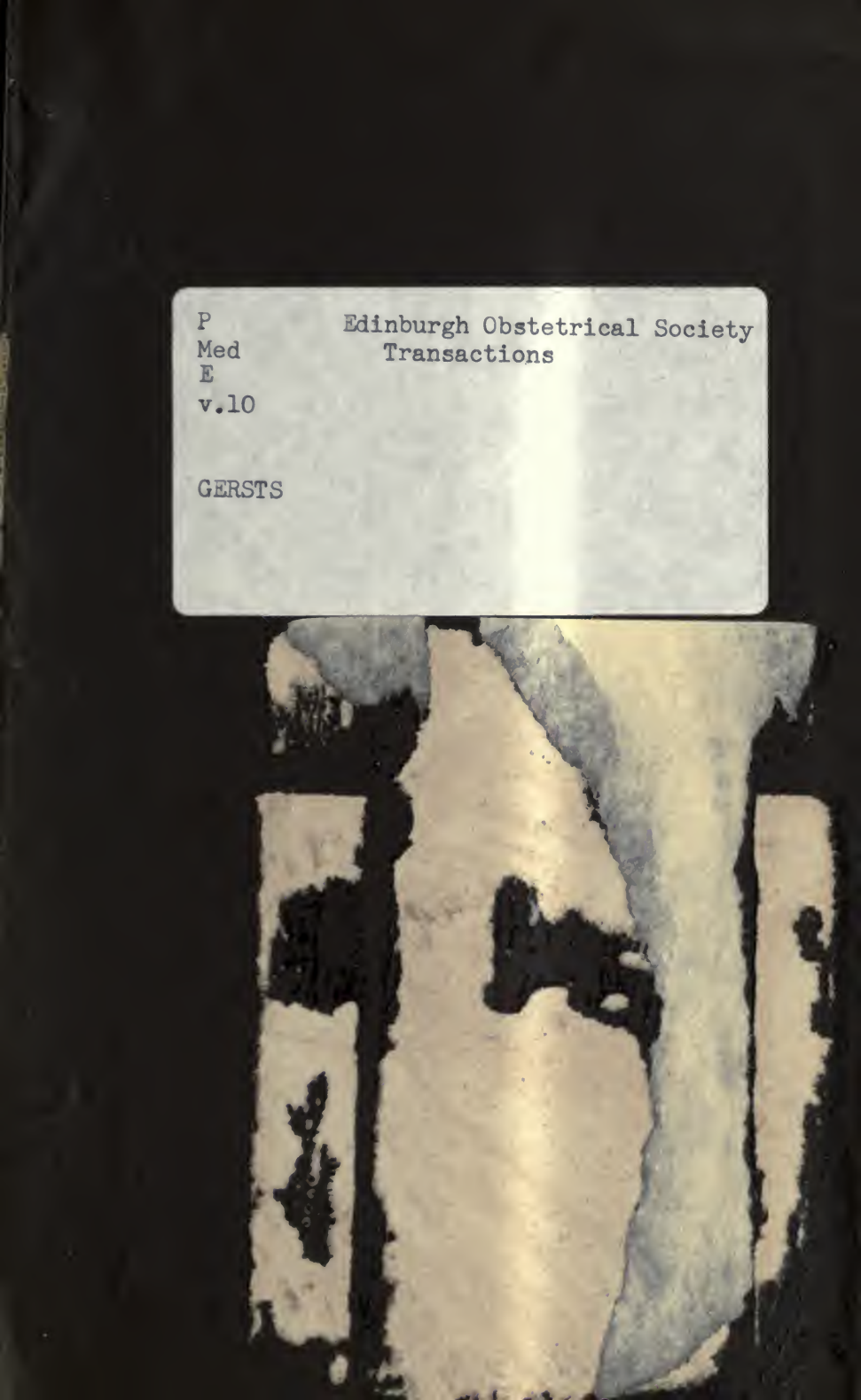
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